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LESSONS IN PSYCHOLOGY.

DESIGNED ESPECIALLY AS AN INTRODUCTION TO
THE SUBJECT FOR PRIVATE STUDENTS, AND
AS A TEXT-BOOK IN NORMAL AND
SECONDARY SCHOOLS.

BY

J. P. GORDY, PH. D.
//

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PREFACE TO THE FIRST EDITION.

LESS than a year ago, a number of teachers, at an institute which the author was attending, requested him to give them Correspondence Lessons in Psychology. He consented, without adequately considering the amount of labor it would involve. For a little reflection enabled him to see that the only author he could recommend to them—Sully—was much too difficult for students of their attainments. He soon saw that the labor of explaining so difficult a book would be much greater than that of writing lessons directly for them week by week. He accordingly decided to do this, and this little book is the result.

This account of its origin will explain a number of its characteristics. As appears from its title, it does not undertake to discuss, even in a superficial way, all the phases of mental activity. It deals only with those facts and laws of mind which, in the judgment of the author, it is most useful for teachers to be familiar with.

The style of the book, as the reader will at once see, is colored by the fact that it was originally written for a class of teachers, with most of whom the author was personally acquainted, and whom he had in his mind as he wrote. Although the "Lessons" have

been carefully revised, he has not thought it necessary to carry the work of revision to such an extent as to take from them that familiar tone which he thought proper to use in addressing a class of pupils.

The book lays no special claim to originality. The object of the author throughout has been to call the attention of his readers to important mental facts in such a way as to set them to observing their own minds and the minds of their pupils, in order to see whether or not he was right. Profoundly convinced as he is of the importance of a knowledge of Psychology to the teacher, he is quite as strongly convinced that the only really fruitful knowledge of Psychology which the teacher will ever gain he will derive from a study of his own mind and the minds of the people with whom he comes in contact, and that books about Psychology are useful chiefly as they give suggestions in this direction. Accordingly, the aim of the author throughout has been to act the part of a guide in a strange city—tell his readers where to look to find valuable truths. If he succeeds in stimulating them to become diligent students of their own minds and the minds of their pupils, he will be more than satisfied.

J. P. GORDY.

Athens, Ohio, July 7, 1890.

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LESSONS IN PSYCHOLOGY.

LESSON I.

THE BENEFITS OF PSYCHOLOGY TO THE TEACHER.

I HAVE no doubt that you believe that it is worth while for you to study a great many things which you do not expect to make of any practical use. You believe, for example, that it is a good thing to study algebra and geometry, not because you think the knowledge of them is likely to be useful to you—unless you should be called upon to teach them—but because you think the study of them will develop your mind.

Probably that is one of the reasons why you wish to study Psychology. And it certainly is a good reason for studying it. I know of no subject better calculated to develop the power of *thinking* than Psychology. You know that the way to develop any power of the mind is to use it, and it is quite impossible to make any headway in studying Psychology

without thinking. That is the reason why it is so hard. When any one makes an assertion about your mind—and that is what Psychology consists of, assertions about your mind and the minds of all human beings—it is often, indeed generally, impossible to realize what it means without thinking. Thus, suppose I say that a mental fact is known directly to but one person, and that one the person experiencing it. In order to realize what that means, you have to look into your own mind for an example of a mental fact. You recall the oft-repeated assertion, nobody knows what one thinks but himself, and you realize that a thought is a mental fact known to but one person directly, and that one the person experiencing it. But in order to know what other facts are mental facts, you must think long and carefully, until you have made up your mind just what facts are known to but one person directly, and that one the person experiencing them.

And even when you can understand an assertion that any one makes about your mind without looking into your own mind, it is generally necessary for you to do so before you can decide intelligently whether or not it is true. Suppose, for example, I say that, no matter how interesting you make your recitations,

you can not get the continuous attention of your pupils without asking questions, or without giving them some other motive for attending besides interest. That statement you can understand without special effort. But in order to determine whether or not it is true, you must *look into your own mind*. You must ask yourself whether any one can keep your attention for a half or three-quarters of an hour simply by being interesting. If you set about answering it in the right way, you will think until you recall some speaker who never asked you questions, or did anything, except try to interest you, to keep your attention, but who was interesting; then I am sure you will remember that, when he was speaking, your mind wandered much more than it would have done if you had known that, when he had finished, he would question you about what he was saying. You will remember that you often allowed your mind to dwell on interesting points that he raised, to the exclusion of what he said directly after.

For these two reasons—(1) because you can not understand most of the assertions in Psychology without thinking; and (2) because, even when you understand them, you can not tell whether or not they are true without thinking—I know of no subject better

calculated to make a pupil think, and therefore better fitted to develop the power of thinking, than Psychology.

But, apart from this, I imagine that you wish to study Psychology for quite practical reasons. As a man who intends to be a surveyor studies trigonometry, not merely because it will develop his mind, but because of the use it will be to him, so you study Psychology because you think the knowledge of it will make you a better teacher.

How will it help you in this direction? Before you can answer this question, you must answer another. What is teaching? People used to intimate what they thought of this by saying that a teacher "keeps school." But "keeping school" is not teaching. Nor is it to teach to hear recitations. To teach is to deal with mind—is to get it to *do* something which it would not have done apart from the teacher, in order to get it to *become* something which it would not have become apart from him. I repeat—and I ask you to notice this statement carefully—to teach is to get the mind to do something, or rather many things, which it would not have done apart from the teacher, in order to get it to become what it would not have become apart from him.

In order to do this intelligently, you plainly need to have as clear an idea as possible of what you wish your pupils to become. You take charge of a school and have a lot of boys and girls whom you want to make different from what they are. If they were everything that you wish them to become, you would not undertake to teach them. What is it that you wish them to become? In what respect do you wish them to change as the result of your teaching? That question, the study of Psychology will help you to answer; and the more you know about Psychology, the more clearly and fully and definitely you can answer it.

Quite likely you think you can answer it now. You say you wish your pupils to have better developed minds at the end of each day than they had at the beginning. But better developed in what direction? The North American Indians, for example, had remarkable powers of observation. They could track an enemy through a forest where you could see no trace of a human being. Will you be content to have your pupils acquire powers similar to those possessed by the North American Indians? Is this what you wish them to become? Again, the Chinese have remarkable memories. I suppose there are

plenty of educated Chinamen who remember almost word for word the nine classics compiled and edited by Confucius. Do you want your pupils to have minds like the Chinese?

I do not, of course, mean to imply that you should not aim to cultivate the observing powers of your pupils as well as their memories. But the North American Indians developed their powers of observation at the expense of the higher powers of their minds, and the Chinese their mechanical memory in the same costly way. And yet they may be said to aim at development. Hence, you see, when one says that the object of education is development, he has not expressed a very definite idea. The question is, What kind of development? and that question Psychology will help you answer.

So you see, that when you say you want to help your pupils develop their minds, you have by no means proved that you know precisely what, as an intelligent teacher, you ought to aim at. And it seems to me that, unless you know what to aim at, you can not hope to have success. Do you think an architect could build a beautiful house if he began to build it and if he worked at it from day to day without having in his mind, so to speak, the house he was

trying to build? Well, if a carpenter must have a picture in his mind of the kind of house he wants to build in order to build it, how can you hope to succeed in moulding and shaping and forming the minds of your pupils in an intelligent way, unless you have the clearest ideas of what you wish them to become?

You will not, I hope, understand me to say that you should have the same ideal for all of your pupils, and treat their minds in precisely the same way. Some of your pupils will, in the future, be artists, some mechanics, some men of business, and the ideal education for them, therefore, differs in important respects. But just as a carpenter, though he builds many different kinds of houses, can not build any successfully without having in his mind a definite idea of what he wishes to do, so a teacher can not do what he ought towards forming the different types of mind which it is his business to form, unless his knowledge of mind enables him to realize clearly the end towards which he desires to work. The faculties of all his pupils do indeed require, to a considerable extent, the same kind of training. All of them should be good observers; all of them should reason logically; all of them should have good memories and vivid imagi-

nations. What I am saying is, that whatever the true end of education for each, the more clearly the teacher conceives it, the better fitted he is to reach it; and this clearness of conception the study of Psychology will help to give him.

But at any rate, perhaps you think you are clear regarding one respect in which you wish your pupils to change; you wish them to become less ignorant—you wish them to know more. But to know more of what? You have not got very far when you say that you wish to help your pupils to acquire knowledge, unless you have made up your mind what knowledge is worth acquiring. There is a good deal of history in the text-books which is not worth learning, and a good deal out of them which is in the highest degree important, and the same is true of the other subjects you teach. How are you to make up your mind what knowledge is worth acquiring? The study of Psychology will help you do that. It will help you see the effect which the acquiring of this or that piece of knowledge will have on the mind, and in this way enable you to estimate its worth.

And here again you see that it is quite impossible for you to succeed in teaching unless in some way you are able to decide intelligently what you ought to

get your pupils to learn. Until you are able to decide that, you can, in the first place, only aim to get them to learn everything in the text-book. And this is bad for two reasons: in the first place, text-books are sometimes written by men who know so little of the subject that they can not tell what is important and what is not important; and in the second place, intelligent men put many things in text-books not that students may learn them, but that they may be able to refer to them if they have occasion to use them. No one but a fool would commit to memory a railroad guide. And yet railroad guides are very useful; but when any one has occasion for them, he goes to them. He remembers what he finds there just as long as he wants it, and then does not trouble his head with it any longer. Now, intelligent men put many such facts in the books they write—facts which they do not expect any one to learn, but to which they think persons may sometimes have occasion to refer. For these two reasons, it is very unfortunate for a teacher to have to rely entirely upon his text-books in deciding what to teach.

Note carefully that, in this lesson, I have been trying to show that a study of Psychology will help you see what you ought to aim at. It will help you

see the kind of development you ought to try to help them get, and the kind of knowledge you ought to try to impart.

QUESTIONS ON THE TEXT.

1. What are the two reasons for studying Psychology?
2. How is any power of the mind developed?
3. What are the two reasons which make the study of Psychology so useful in developing the power to think?
4. What is teaching?
5. Give two illustrations to show that when you say you wish your pupils to have better developed minds, your statement lacks clearness.
6. Show that you can not succeed as a teacher unless you know what to aim at.
7. Show that when you say you wish to make your pupils less ignorant, your statement lacks clearness.
8. How will the study of Psychology help you in this direction?
9. Why should not a teacher limit himself to teaching what is in the text-books?
10. What is the central thought which this lesson aims to bring out?

SUGGESTIVE QUESTIONS.

1. Which do you regard as the more important service rendered by the study of Psychology to the teacher—increasing his power of thought, or his knowledge of the conditions under which the mind acts?
2. One writer speaks of a certain kind of memory as the "index" memory, and another of another kind as the "mechanical" memory. Can you get from this lesson any idea of what they are?

LESSON II.

THE BENEFITS OF PSYCHOLOGY TO THE TEACHER.

TO succeed well in any difficult undertaking, three things are necessary: (1) one must see clearly the thing to be done; (2) he must have a clear idea of the best means of doing it; and (3) he must have a strong motive for doing it well. He in whom these conditions meet most perfectly—who sees most clearly the thing to be done, who has the clearest perception of the best means of doing it, who has the strongest motive for making strenuous efforts to do it—is the likeliest person to succeed in any difficult undertaking.

I do not believe the study of Psychology can be urged on the ground that it is likely to do much toward making the teacher interested in his work, and more willing, therefore, to work hard in order to do it well. I think, indeed, that it is not without effect in that direction. The work of teachers who make no study of mind is likely to be mechanical, while the work of teachers who base their efforts on a knowledge of mind is rational. And mechanical work is uninteresting, unattractive—fit only for

machines. Anything, therefore, which tends to make a teacher's work rational certainly tends to make it interesting. I think that this was what Fitch meant when he called teaching the noblest of arts and the sorriest of trades. Practiced mechanically, it is indeed a trade, and a sorry one at that; practiced rationally—practiced by one who realizes that he is dealing with mind, and who uses this method or that, not because some one else has used it, but because his knowledge of mind leads him to believe that it is the best—it is the noblest of arts.

But while I believe that the study of Psychology is of some benefit to the teacher in that it tends to give him more interest in his work, I do not urge it on this ground. It is for the other two reasons, (1) because of the clearness which it is fitted to give to the aim of the intelligent teacher, and (2) because of the light it throws on the best methods of realizing that aim, that it seems to me no teacher who is ambitious to succeed should neglect to study it as thoroughly and as faithfully as possible.

In the last lesson I tried to show what the study of Psychology can do for you in the first direction. I tried to show that when you are able to say that your aim is to bring about the development of your pupils,

you have not got very far unless you have made up your mind as to the value, so to speak, of the various faculties of the mind—that unless you know the worth of the observing powers, and of the various kinds of memory, imagination, and reasoning, you can not proceed intelligently in training them. And in like manner, unless you have made up your mind as to “what knowledge is of most worth,” I tried to show that it is of little use to be able to say that you wish to induce your pupils to acquire knowledge. I tried further to show that Psychology, by helping you to see the relation of the various powers of the mind to each other, will help you to see the kind of development you ought to aim at; and also that, by helping you to see the effect of the various kinds of knowledge upon the mind, it will help you to decide “what knowledge is of most worth.”

But not only will the study of Psychology tend to give clearness and definiteness to your aim, it will tend quite as strongly to show what you must do to realize that aim.

In dealing with mind we must use the same kind of methods which we use when we deal with objects in the material world. What we accomplish in the material world we accomplish by putting objects

where they will be subject to new influences, so that the forces of nature may do the work we wish to have done. Mortar in one place and bricks in another do nothing to make the walls of a house, but place the bricks on a strong foundation, and put the mortar between them, and you have a strong wall. All you have done, you will note, is to *move* the bricks and mortar so as to put them in new positions and make them subject to new influences, so that the forces of nature could do the desired work. Heat water to the boiling point, and it will change into steam; and if you leave it where it can escape, nothing will come of it. But move the water into a confined place, so that the steam can not escape, and then you can make it drive immense palaces across the sea, or pull huge trains across the continent. Every invention which has ever been made is simply a way of moving things into new positions where they are subject to new influences, so that the forces of nature may do the desired work. *All the force that is employed in nature exists in nature. All that man accomplishes he accomplishes by making the forces of nature work under different circumstances, and by turning them into different channels from those in which they would have worked apart from him. It is by making nature our servant that we have*

made such wonderful progress in material civilization in the nineteenth century. And how is it that we have been able to make nature work for us in such wonderful ways? Simply by knowing the laws of nature. Knowing the laws of nature, we have been able, so to speak, to foresee what she would do under certain circumstances, and the result is the steam-engine, the telegraph, the telephone, the phonograph, and all the other inventions which minister to our well-being.

In dealing with mind we must work in the same way. Precisely as everything which happens in nature is due to the laws of nature, so everything which happens in mind is due to the laws of mind. Precisely as our power in nature depends upon the skill with which we get her to work for us, so our power in dealing with mind depends upon our ability to get it so to act that the results we desire will follow. Precisely as success in dealing with nature consists in supplying the conditions which make it possible for nature to do the desired work, so success in dealing with the mind consists in supplying the conditions which make it possible for the mind to do the work we want it to do. And precisely as the better we know the laws of nature—in other words, the better

we know the conditions under which nature will produce this or that result, the better we can supply them—so the better we know the laws of the mind; the better, in other words, we know the conditions under which the mind will do this or that, the better we can supply them. The aim of the teacher being a certain kind of development, and the communication of a certain kind of knowledge, evidently the more he knows of the conditions under which the mind develops, and the conditions under which it acquires knowledge, the better he can supply them.

“But is there no difference,” you may ask, “between a natural agent and the human mind in this regard? May we say of the human mind, as we may of a natural agent, that it will always do all the work it can under the given conditions?” There is an important difference, but it makes for rather than against the skillful teacher. A natural agent can not be flattered, bribed, or cajoled; it takes no account of intentions or motives. In dealing with a natural agent, the one single, simple, all-determining question is, Are the conditions fulfilled? If they are fulfilled, the effect will follow; if they are not fulfilled, the effect will not follow. But the case is different with the human mind. When we have put the mind under

the right influences, it has a *natural tendency* to the kind of activity we wish to occasion; but this tendency may be increased or diminished by purely personal relations. A teacher, for example, who adapts the subject of instruction to the mental condition of his pupil creates a *tendency* in the mind of his pupil to follow his instruction with interest. But if by impatience, ill-humor, or sarcastic remarks the teacher has excited the antagonism of the pupil, the pupil *resists* the tendency; he is unwilling to do what he knows his teacher desires. If, on the other hand, the teacher by patience and industry and kindness has gained the regard of his pupil, the pupil *exerts* himself to attend to the subject. In this way it happens that personal qualities may atone, to some extent, for lack of skill on the part of the teacher.

Do you ask if a corresponding increase in the teacher's knowledge of mind, and a corresponding increase in his skill in basing his work on that knowledge would enable him to work such miracles in the minds of his pupils as inventors have worked in nature through their knowledge of the laws of nature? I can not, of course, answer such a question. No one can. But in the School of the far-off Future—when no teacher will be allowed to enter a school-

room who has not made a thorough study of Psychology, and who has not proved to the entire satisfaction of competent judges his ability to apply what he has learned—in that school there will be no dull, listless, inattentive pupils. There will be no boys who leave school because they do not like it. There will be no pupils who hate books. As a child learns not only rapidly but with intense pleasure from the time of his birth to the time he starts to school *simply because the activities in which he spontaneously engages are fitted to his state of development, so he will continue to learn rapidly and with intense pleasure after he starts to school if the work he is set to doing is adapted to his state of development.* Do you know who Comenius was? It was he who said if our pupils do not learn it is our fault. And he was undoubtedly right. If we supplied the proper conditions, our pupils would as certainly learn as a train will move when the engineer turns on the steam. Do you know who Pestalozzi was? It was he who said that if pupils are inattentive the teacher should first look to himself for the reason. And he also was undoubtedly right. As certainly as a blade of corn will grow and mature if it is treated right—if the proper conditions are supplied—so certainly will

our pupils attend, and think as the result of attending, and develop as the result of thinking, if we supply the proper conditions.

I say "if we supply the proper conditions." It is but truth to say that that sometimes is beyond our power under the circumstances under which we are obliged to work. Some pupils have so little capacity for a subject that to supply the proper conditions would require an amount of attention which the teacher can not possibly give them. It is doubtful also if there are not cases in which there is so little capacity for a subject as to make it a waste of time for the pupil to attempt to study it. A case came under my own observation of a boy who would spend *five hours* on a spelling lesson, and still miss nine words out of ten. I am strongly inclined to the opinion that spelling was an accomplishment which he could not afford to acquire. (See Appendix A.)

QUESTIONS ON THE TEXT.

1. What three things are essential to success in a difficult undertaking?
2. What can the study of Psychology do to make a teacher interested in his work?
3. What did Fitch say about teaching, and what did he mean by it?

4. How will the study of Psychology help a teacher to see at what he should aim?
5. How do men accomplish anything in nature?
6. Illustrate your statement.
7. Show that the same thing is true in our dealings with mind.
8. Do you believe that teachers could accomplish as wonderful results in dealing with the minds of their pupils as inventors have accomplished in dealing with nature if they knew as much about mind?
9. Why do so many pupils dislike the work of school?
10. What did Comenius say was the reason our pupils do not learn?
11. Is there anything in our system of classification which increases the difficulty of adapting our work to individual pupils so as to make it pleasant to them?
12. What can be done to obviate this?

SUGGESTIVE QUESTIONS.

1. Who is Fitch?
2. What book on education has he written?
3. Who was Comenius? When did he live?
4. Who was Pestalozzi, and when was he born?
5. What reform did he work in education?

LESSON III.

WHAT IS PSYCHOLOGY?

IN the last two lessons I tried to show that the study of Psychology will help you to see the goal that you should try to reach, and what course you should take in order to reach it. But while we have been talking about how Psychology will help you in teaching, the question, What is Psychology? has been left unanswered. That question I shall try to answer in this lesson.

The answer usually given is that Psychology is the science of the mind or soul. But what is the soul? People who have not thought carefully about it would probably say that, whatever it is, it certainly is not the mind. Animals, they would say, plainly have minds, but no one believes that they have souls. I think it may serve to give clearness to our ideas to consider the question whether or not animals have souls. And without doubt *in the confused sense in which the word is used in popular language* the true answer is that they have. If you suppose that animals have no souls, let me ask you if you have one.

You will undoubtedly say that you have. Suppose I ask you whether you are always dreaming when you are asleep? You will probably answer that you are not. And when you say that you are not dreaming, what do you mean?

"I mean," I imagine you saying, "that there are no thoughts or feelings in my mind."

"And when there are no thoughts and feelings in your mind, does your soul continue to exist?"

"I do not understand you."

"You say that you do not think you are always dreaming when you are asleep; and when you say that you are not dreaming, you say that you mean that you have no thoughts or feelings in your mind. So far as thoughts and feelings go, I understand you to say that you are exactly like a dead man. A dead man has no thoughts and feelings, neither have you when you are not dreaming. Now, when you have no thoughts and feelings in your mind, does your soul continue to exist?"

"I certainly believe it does, as I have no reason to believe that it ceases to exist when I fall asleep and begins to exist as soon as I awake, as must be the case if it ceases to exist when I have no thoughts and feelings."

"Then you do not mean by soul the thoughts and feelings of which you are conscious, or a part of those thoughts and feelings?"

"Again I do not understand you."

"You say that your soul does not cease to exist when you have no thoughts or feelings; now, if it does not, your soul can not be your thoughts and feelings, can it?"

"Why not?"

"Because if it were, when you have no thoughts and feelings you would have no soul, would you?"

"I see that I would not."

"And it can not be a part of your thoughts and feelings, can it?"

"No, for if it were any part of them when I had none of any kind, I would have no soul."

"You mean by soul, then, not thoughts and feelings, but the thing that *has* thoughts and feelings?"

"Again I am obliged to say that I do not understand you."

"A German professor is said to have begun a first lesson on Psychology in this way: 'Students, think about the wall.' After a moment's pause, 'Now think about the thing that thinks about the wall. The thing that thinks about the wall is what

is to be the subject of your study.' That is what you mean by soul, is it not—the thing which thinks and feels, the thing which has thoughts and feelings?"

"It is."

"And what do you mean by mind?"

"I mean that which thinks and feels, or that which has thoughts and feelings."

"But things which are identical with the same thing are identical with each other, are they not?"

"They are."

"And if the soul is that which thinks and feels, and the mind is that which thinks and feels, they must be the same, must they not?"

"I see that they must."

"If then you say that dogs, for instance, have minds, can you refuse to admit that they have souls?"

"I am obliged to confess that I can not."

In this imaginary dialogue you may say that in the nature of the case I can prove what I wish to prove, since I can put any words in your mouth I please. But if you will carefully consider it, you will see that you are obliged to say that the soul is one of three things: It is either *all* of our thoughts and feelings, or a part of them, or the thing which *has* thoughts and feelings—the thing which thinks and feels and

wills. If you say that the soul is all or a part of our thoughts and feelings—mental facts, in a word—then, instead of saying that Psychology is the science of the soul, it would be much plainer to say that Psychology is the science of mental facts. But if you say that the soul is that which thinks and feels and wills, then, as we have seen, there is no difference between soul and mind, and we are left with the definition, Psychology is the science of the mind.

But what do you mean by mind? What we have seen in the case of the soul—that it consists of thoughts, feelings, and acts of the will, or *that which* thinks, feels, and wills—is plainly true of the mind also. It must either be *that which* thinks, feels, and wills, or it must be the thoughts, feelings, and acts of will of which we are conscious—mental facts, in one word. But what do we know about *that which* thinks, feels, and wills, and what can we find out about it? Where is it? You will probably say in the brain. But if you are speaking literally, if you say that it is in the brain, as a pencil is in the pocket, then you must mean that it takes up room, that it occupies space, and that would make it very much like a material thing. In truth, the more carefully you consider it, the more plainly you will see what thinking men have known

for a long time—that we do not know and can not learn anything about the thing which thinks and feels and wills. It is beyond the range of human knowledge. The books which define Psychology as the science of the mind have not a word to say about that which thinks and feels and wills. They are entirely taken up with these thoughts and feelings and acts of the will—mental facts, in a word—trying to tell us what they are, and arrange them in classes, and tell us the circumstances or conditions under which they exist.

It seems to me, therefore, that it would be better to define Psychology as the *science of the experiences, phenomena, or facts of the mind, soul, or self—of mental facts, in a word.*

But what is a mental fact? Let us say, to start with, that it is a fact known directly to but one person, and that the person experiencing it. If you are standing on the street with a half dozen friends, you can all see the houses, and men and women and horses. You can all hear the tramping of feet and the clatter of the vehicles that pass along the street. These facts are open to the observation of all of you alike. But there is a class of facts known directly to but one of you—what you think and feel and will, you know,

and no one else does; what A thinks and feels and wills, he knows, and no one else does. These thoughts and feelings and volitions are experiences, phenomena, or facts of the mind, soul, or self—mental facts, in a word—facts known to but one person directly, and that the person experiencing them.

But I believe there are mental facts not known to any one. If you are intent upon a book, the clock may strike and you may not hear it at the time, and a minute after you may be entirely sure that you heard the clock strike a minute before, although you did not know that you heard it at the time. The true explanation of facts like these seems to be that the clock produced a sensation which you would have known was a sensation of sound if you had attended to it at the time the clock struck, and in the sense of having received a sensation of sound because of the clock, you heard it. But you did not know that you heard it until the minute after. Now, what must we call this sensation? Plainly a mental fact, although there was a time when it was not known by any one. Still, however, it is marked off quite sharply from all other facts—physical facts we may call them, which may be known with equal directness by any number of people—by the circumstance that although not known, it is

knowable by but one person, and that the person experiencing it. We may then define a mental fact as a fact known or knowable to but one person directly, and that the person experiencing it, and Psychology as the science of mental facts, or the science of the facts of mind.

QUESTIONS ON THE TEXT.

1. How is the question, "What is Psychology," usually answered?
2. Would you say that dogs have souls?
3. How would you defend your answer?
4. What is the objection to defining Psychology as the science of the mind or soul?
5. How would you define Psychology?
6. What is a mental fact?
7. What is a physical fact?
8. Into what two classes would you put mental facts?
9. Can you have mental facts without knowing that you have them?
10. Give examples.

SUGGESTIVE QUESTIONS.

1. Do animals reason?
2. Are you ever in a state of dreamless sleep?
3. What is the difference between matter as a substance, and matter as a group of phenomena?
4. What do we know of matter as a substance—of the experiences, phenomena, or facts of the mind, soul, or self?
5. Why is it that it so often happens that you can not tell your motives for what you do?
6. In what sense is it true that the soul is in the brain?

LESSON IV.

THE SUBJECT MATTER OF PSYCHOLOGY.

IN the last lesson I tried to point out the subject of which Psychology treats. I objected to the usual definition, "Psychology is the science of the mind or soul," not because it is incorrect, but because I do not believe it gives young students definite ideas. I want you to get at the outset the clearest possible notion of the subject you are to study. I want you to realize that the facts of which you are directly conscious, the facts known directly to you only—that these and similar facts form the subject of which Psychology treats.

It may, perhaps, serve to put the subject matter of Psychology in a clearer light to contrast mental facts with physical facts. A physical fact, as we know, is one open to the observation of all men. Trees, and houses, and flowers, and fences—the whole of external nature, in a word—are physical facts, since we can all of us observe them with equal directness. But what shall we say of the brain, or any of the internal organs of the body? Are they mental facts? They

are, *provided* they are known to but one person directly, and that the person experiencing them. But careful reflection will convince you that no one has any direct knowledge of his body. That we have such an organ as the heart, for example, was established by a process of reasoning. If we had known it directly, it is hard to see why the world was obliged to wait for Harvey to demonstrate the circulation of the blood—why it was not from the beginning a matter of direct knowledge. Strange as it may seem at first thought, it is pretty nearly absolutely certain that we have no direct knowledge of our own bodies. We learn of the existence of our own bodies as we do of the rest of the external world, by a process of reasoning. Descartes long ago said that if we could move the sun or moon by an effort of will, as we can our hands and feet, we should regard them as a part of our own bodies. The sole difference, so far as Psychology is concerned, between any external object, as a tree, and our bodies, is (1) that the former does not move in obedience to our wills, and (2) that it is not a source of sensations as our bodies are. I put my hand on a hot stove, and I have a feeling of pain. I put a stick in the same position, and I have no such sensation.

Any one who has ever watched a very young child

will be quite sure that he has not discriminated his body from the rest of the external world. He first confuses his body with the rest of the external world. Little by little he comes to learn that a little piece of this external world sustains a very peculiar relation to him—that it obeys his will, moves when he wishes it to move, stops when he wishes it to stop, and that it is the direct occasion of pleasure and pain as nothing else in this world is. These two facts, then, and these two facts alone, distinguish our bodies from the rest of the external world, so far as Psychology is concerned, and give us our peculiar interest in them.

While this course of reasoning makes it entirely clear that the internal organs of the body are not mental facts, another course will make it equally clear that they *are* physical facts. Is a pencil in a drawer a physical fact? No one can see it. No, you say, but every one can see it if it is taken out of the drawer. Precisely. We need, then, to think of a physical fact as one open to the observation of all men, *certain conditions being complied with*. Bearing this in mind, we see that the various internal organs of the body are physical facts, because when the body is dissected they are open to the observation of all men, precisely as is a tree or flower,

Hoping, then, that the difference between mental and physical facts is so clear that there will be no danger of confusing them, permit me to call your attention a little more closely to the mental facts which we are to study, in order that we may avoid a mistake into which many people fall—the mistake of supposing that any of the mental facts of which we are conscious are simple. You remember our definition of Psychology—the science of the facts, phenomena, or experiences, which, *when we are conscious of them*, we are conscious of as experiences of the mind, soul, or self. The point I wish to emphasize is that we are never conscious of any experience, *separated or detached from the mind*. As you read this, you are, perhaps, conscious of attending. Look into your own mind and see what it is you are conscious of—it is of *yourself attending*, is it not? And not of an abstract act of attention. So, also, when you perceive or remember or imagine or reason, what you are conscious of is not an abstract act of perception or memory or imagination or reasoning, but yourself perceiving, yourself remembering, yourself imagining, yourself reasoning. This, of course, is only another way of saying that *you yourself enter as a constituent into every mental fact of which you are*

conscious. In other words, in being conscious of mental facts, we are conscious of ourselves. Many writers appear to think that a mental fact of which we are conscious exists independently of the mind and separate from it, as a tree or a stone seems to do. But a careful looking into your own mind will convince you that they are mistaken; it will convince you that when you are conscious of a mental fact you are really conscious of *yourself in a certain act or state, of yourself having a certain experience*. As you never know the act or state or experience apart from yourself, so you never know yourself apart from the act or state or experience. Hume said that when he looked into his own mind he always found thoughts and feelings and acts of the will, but he never found anything else—he never found any self. Certainly not in the sense in which he was speaking. He was looking for a self apart from, and independent of, the various thoughts and feelings and acts of the will of which he was conscious, and no such self is to be found. The self of consciousness, I repeat, exists—not apart from, but as an element of, the various experiences of which we are conscious.

You will be careful to note that the mental facts into which the mind enters as a constituent are those

of which we are conscious. I have already tried to show that mental facts exist in the lives of each of us of which we are not conscious; mental facts of the existence of which we never know save by a process of reasoning. Of such mental facts the mind is not an element, and that is precisely why we are not conscious of them. The mind is conscious or has direct knowledge of only its own acts or states or modifications or experiences. A mental fact which is not an act or state or modification of the mind, the mind can learn the existence of only by a process of reasoning. And now I hope the scope of our definition of Psychology is entirely clear. Psychology is the science of those facts, phenomena, or experiences which, when we are conscious of them, we are conscious of as experiences of the mind, soul, or self.

QUESTIONS ON THE TEXT.

1. What is the usual definition of Psychology, and what is the objection to it?
2. Is the brain a mental fact? Why not?
3. How do we come to distinguish our bodies from the rest of the external world?
4. What is the difference between a mental fact of which we are conscious and one of which we are not conscious?
5. Why is it that we are not conscious of some mental facts?
6. State and explain the definition of Psychology?

SUGGESTIVE QUESTIONS.

1. When was Harvey born, and what did he do?
2. Descartes is called the father of modern philosophy; what does that mean? When was he born?
3. Hume is called a philosophical skeptic; what is a philosophical skeptic?

LESSON V.

THE METHOD OF PSYCHOLOGY.

"BUT in what kind of mental facts," perhaps you ask, "is Psychology interested? I had the toothache yesterday; that, if I understand you, was a mental fact; but Psychology has no interest in such facts, has it?" No and yes. That you, John Smith, had the toothache is a matter of indifference to Psychology. Psychology has no more interest in that fact than the science of Botany has in the fact that you have a bed of geraniums. Like all sciences, its aim is general knowledge; and that you, John Smith, had the toothache is not general knowledge—it is knowledge of an individual. But when you had the toothache, you found it difficult to study, did you not? You can doubtless recall many similar cases in your experience—cases in which severe pain interfered with that concentration of mind which we call study. And keen delight is just as unfavorable to study. You got a letter some time ago that made you very happy—so happy that you could not concentrate your mind on your work for an hour; and you find that the ex-

perience of other people is like yours in this regard. So, although Psychology cares nothing about *your* toothache, there is something in the experience that it does care about. *So far as your experience illustrates what is true of all minds under similar circumstances, so far it is a matter of interest to Psychology.*

Or I might say that what Psychology especially seeks to ascertain is *laws* of mind, or mental facts. A law of mental facts is a general truth about mental facts—something which will be true not only in all your experience, but in the experience of every one under similar circumstances. We have just been considering an example of a law of mental facts—that intense feeling, whether of pleasure or pain, can not exist along with concentration of mind on another subject. That is a law of mental facts, because it is true of the experiences of all men without exception. Since one of the *conditions* of concentration of thought—one of the things which makes it possible—is the absence of intense feeling, concentration of thought, on a subject foreign to the feeling, never can coëxist with intense feeling. That is a perfectly general proposition, and, as such, illustrates a law of the mind.

Evidently, then, to ascertain laws of the mind, you

must not only study the facts of your own experience, but those of other people. If you confine yourself to your own experience, you can not be sure that your knowledge is general; you are liable to confuse a personal peculiarity with a principle of human nature. Imagine Andrew Jackson endeavoring to get a knowledge of human nature by studying himself alone. If he took himself as a type of men in general, he would have very erroneous ideas of human nature.

But can you study the minds of other people in the same way as you can your own? Try it. You often wish to know whether your pupils are attending to you, or whether they understand you. Can you find out, in the same way, that you know whether or not you are attending? Plainly not. You know that you are attending simply by *looking into* your own mind, and you can not look into the mind of any one else. The word which means looking into is "introspection;" and the adjective "introspective" seems, therefore, to best describe the way or mode or method in which you study your own mind. But you can not learn anything about the minds of other people in that way. When you study other people, you notice their looks and actions. Many teachers think they can tell whether their pupils are attending

to them without asking questions. They look or act as though they were attending, and so the teachers who believe this conclude they are. *Conclude*, I say. Note the word. It denotes a process of reasoning. And when we study the minds of others, we have to do it by processes of reasoning—by acts of inference. You do not even know that there is any one in the world besides yourself except by a process of reasoning. When you say you see a man, the truth is that you have sensations of color, and from this fact infer the presence of a human being like yourself. When you see this human being laugh, you infer that he is amused, just as you are conscious of being amused when you laugh. All that you learn of any human being you learn by reasoning—by inference. As, then, we call the method of studying our own minds the *introspective*—since we study them by looking directly within—so we may call the method of studying the minds of others the *inferential*, since we do it by processes of inference.

Whatever you learn about the minds of others—whether you learn it from what you see them do, or what you read about them—you learn by means of the inferential method. When you learn how Washington exposed himself when Braddock's army was

routed, and at the battle of Princeton, you infer that he was brave, precisely as you would have done if you had seen him. Since all the facts of human history relate to the actions of men, they are materials which the inferential method uses to increase our knowledge of human nature. When we learn, for example, that the ancient Greeks left their weak children exposed, in order that they might die, the inferential method enables us to see that Greek fathers and mothers did not love their children as fathers and mothers love their children now, and that they probably loved their country more, since a weak child was considered of no worth because it gave no promise of being able to be of service to the state. When we know that Aristotle said that all that was necessary to reform or relax the manners of a people was to add one string to the lyre or take one from it, the same method enables us to see that the Greeks had a susceptibility to music of which we can scarcely have any idea to-day. When we know that "those doughty old mediæval knights" "despised the petty clerk's trick of writing, because, compared to a life of toilsome and heroic action, it seemed to them slavish and unmanly," we know that they looked upon a very different world from ours—a world of different aims and ideals; that the

knowledge we prize so highly, and toil so painfully to gain, was a thing of no value in their eyes. The inferential method even uses the relics of the prehistoric ages to add to our knowledge of men. It takes the rough tools of the cave-dwellers and forces from them a little knowledge of the strange men who used them.

I have said that the introspective method is the method we use in studying our own mental facts. That needs qualification. It is possible for us to study our own minds by means of the inferential method. People often forget their motives for their actions. They say, "I do not know how I came to do that." In such cases they can learn their motives only by means of the inferential method, precisely as though they were other people whose actions they were considering, and which they were trying to account for. Further, the introspective method can only give us individual facts. As the bodily eye only sees isolated objects, and can not connect them by laws, so the eye of the mind only sees isolated mental facts, and can not connect them together by laws. In other words, we observe facts—not laws. Laws are the result of inference—never of direct observation.

The introspective and inferential methods, then—

the two methods of studying mind—evidently sustain a close relation to each other. You can, indeed, use the introspective method without the inferential, in the mere collection of facts; but you can not use the inferential at all without the introspective. When you infer that people have such and such mental facts under such and such circumstances, it is because you know by introspection that you have the same mental facts under the same circumstances. The laughter and tears of others would have no meaning to you if you had never known amusement or sorrow.

Each of these methods has its peculiar difficulties. The results reached by means of the inferential method are always more or less uncertain. If you have ever made a thorough study of the history of any great man, you have doubtless had an excellent illustration of this. While different historians generally agree substantially as to the actions of men, they differ very widely in their interpretations of those actions. Federalist historians, and those who sympathize with them, usually regard Jefferson, for example, as a demagogue, while Democratic historians regard him as a sincere and devoted patriot. The reason of course is that, using the inferential method,

the one explained his actions by one set of mental facts, the other by another.

A passage in John Fiske's "The Beginnings of New England," gives such an excellent illustration of the inferential method and its difficulties that it deserves to be quoted at length:

"It is difficult for the civilized man and the savage to understand each other. As a rule, the one does not know what the other is thinking about." And then, speaking of Eliot, and what the Indians thought about him, the author goes on: "His design in founding his villages of Christian Indians was in the highest degree benevolent and noble, but the heathen Indians could hardly be expected to see anything in it but a cunning scheme for destroying them. Eliot's converts were for the most part from the Massachusetts tribe, the smallest and weakest of all. The Plymouth converts came chiefly from the tribe next in weakness—the Pokanokets, or Wampanoags. The more powerful tribes—Narragansetts, Nipmucks, and Mohegans—furnished very few converts. When they saw the white intruders gathering members of the weakest tribes into villages of English type, and teaching them strange gods while clothing them in strange garments, they probably supposed that the pale faces

were simply adopting these Indians into their white tribe as a means of increasing their military strength. At any rate, such a proceeding would be perfectly intelligible to the savage mind, whereas the nature of Eliot's design lay quite beyond its ken. As the Indians recovered from their supernatural dread of the English, and began to regard them as using human means to accomplish their ends, they must, of course, interpret their conduct in such light as savage experience could afford. It is one of the commonest things in the world for a savage tribe to absorb weak neighbors by adoption, and thus increase its force preparatory to a deadly assault upon other neighbors."

The great difficulty with the introspective method is that a mental fact vanishes as soon as you begin to examine it introspectively. The feeling of amusement, of course, is a mental fact. The next time you are amused, suppose you try to analyze the feeling. Some psychologists say that it consists in part of a feeling of superiority. If you make a study of your experience to see whether they are right, your feeling of amusement will disappear. Or suppose you try to ascertain what sort of a mental fact pity is. When you find yourself pitying some one, if you examine

your experience to see what pity is, the feeling will vanish. If the nature of flowers were such that they disappear the moment one begins to observe them closely, the study of Botany would exactly illustrate the difficulty of studying the mind by means of the introspective method. And as, in such a case, the botanist would have to content himself with observing his facts in the dim light of memory, so also must the psychologist. As his facts disappear the moment he begins to examine them, his only resource is to appeal to the memory—his introspection becomes retrospection.

Of course the minds that are of the most importance for you as teachers to study are the minds of children, and it is evident that you must study them by means of the inferential method. If you would get that knowledge of them that will enable you to teach them well, you must note their likes and dislikes, their amusements, their games, the books they read, the mistakes they make—everything, in short, that may throw light on their minds. Do not rely on any knowledge of the mind you can get from this or any book. A good book on Psychology is like a guide in a strange city—useful chiefly in telling you where to look. But as a guide is of no service to a man who

refuses to use his eyes, so a writer on Psychology can be of little use to his readers unless they constantly test his statements by their own experiences and by the study of the minds of those around them.*

QUESTIONS ON THE TEXT.

1. What kind of mental facts constitutes the science of Psychology? Illustrate.
2. What is a law of mental facts? Illustrate.
3. State and explain and illustrate the two ways of studying mental facts.
4. Illustrate how the inferential method uses historical facts to enlarge our knowledge of mind.
5. How can you study your own mind by means of the inferential method?
6. Point out the relations that exist between the two methods.
7. State and illustrate the difficulties of the two methods

SUGGESTIVE QUESTIONS.

1. Are there any mental facts which do not form part of the science of Psychology?
2. Do you know any facts which indicate that there is a difference in the keenness of internal perception in different people?
3. If you were a Turk or a Chinaman, and knew nothing of any other people, how would it influence your notion of human nature?
4. Is pity a state of pleasure?
5. How does the quotation from Fiske illustrate the difficulties of the inferential method?

*For a brief explanation of some varieties of the inferential method, see Appendix B.

LESSON VI.

NECESSARY TRUTHS AND NECESSARY BELIEFS.

WE would all agree that geometry does right to state its axioms at the beginning. All its demonstrations depend upon them, and therefore it is proper that they should receive our attention at the outset.

For similar reasons it is important for us to ascertain as clearly as possible what we can learn by means of the introspective method. Since the introspective and the inferential methods are the only methods of studying mental facts, and since the inferential is based on the introspective, what we learn by means of the introspective method lies at the foundation of our knowledge of mind. If you were building a house, you would be especially careful about the foundation. You would want it all strong and well made, but you would take particular pains to see that there was no flaw in the foundation. No matter how strong and fine and beautiful the rest of the house might be, you would feel that if the foundation was weak the whole thing might come tumbling down about you any day.

- 1 So it behooves us to look carefully to the foundation of our knowledge of mind, and therefore to ascertain precisely *what kind of knowledge* we have of the facts known to us through introspection, and *what we can learn* by means of it.

But the knowledge gained by introspection so closely resembles another kind of knowledge that the two are liable to be confused, unless at the outset the latter is clearly explained. To this end permit me, in imagination, to talk with you about some familiar matters.

"Have you ever seen a stick with but one end, or a white crow?"

"No," you answer.

"Do you think it possible that you ever shall?"

"Possible to see a white crow? Certainly there is no impossibility in that. I know no reason why a bird might not exist like the crow in every respect except the color of its feathers. But a stick with one end? That is not merely an impossibility; it is an absurdity. You can not even assert its existence."

"Pardon me, but I think you are mistaken. 'This stick has but one end.' Have I not asserted its existence?"

"Apparently, but not really. You have indeed

strung a lot of words together in the form of a sentence—a sentence to which I have no objection on the score of grammar. But there is one fatal objection to it; it does not mean anything.”

“Does not mean anything? I do not understand you.”

“Your statement does not express any action of the mind. All sentences that mean anything are expressions of thought. But when you say, ‘This stick has but one end,’ you have simply used your organs of speech; you have not *thought* anything. I might teach a parrot to say, ‘Kant’s arguments in defense of the antinomies of human reason have never been refuted.’ But what would those words mean in the mouth of a parrot? Nothing, and that is all you mean when you assert the existence of a one-ended stick.”

“Possibly I am stupid, but I really do not see why.”

“For this very simple reason: The meaning of stick is a thing that has two ends. When, therefore, you say ‘This stick has but one end,’ it is equivalent to saying, ‘This two-ended thing has but one end; this thing, which has two ends, has but one end.’ Now it is easy enough to *say* that, but impossible to think it, is it not?”

"I see that it is. A thing can not have two ends and but one end at the same time; it can not both be and not be."

This is an example of what metaphysicians call necessary truths*—"a truth or law the opposite of which is inconceivable, contradictory, nonsensical, impossible."† A little reflection will enable us to think of many others. Two straight lines can not inclose a space; two+three=five; these are examples of necessary truths because the opposite of each of them is inconceivable, contradictory, nonsensical, impossible. If two straight lines could inclose a space, they could be straight and crooked at the same time; if two+three could be more or less than five, it could be itself and not itself at the same time, which is absurd, contradictory, impossible.

To determine whether a proposition expresses a necessary truth or not, we must see if we can put any meaning into the proposition which contradicts it. But in applying the test we must be on our guard against confusing—*putting a meaning into the subject and predicate with putting a meaning into the proposition*. This square is round. Here both subject and

* These are sometimes called intuitions.

† Ferrier's Institutes of Metaphysics, page 20.

predicate bring up familiar ideas. But a moment's reflection enables us to see that the intelligibleness of the subject and predicate is a very different thing from the intelligibleness of the proposition. For if the square is round, it is itself and not itself at the same time, which is unthinkable and impossible.

Let us now turn our attention to a class of propositions that, at first sight, look very much like necessary truths, but which, nevertheless, are fundamentally different. You go to your room on a cold winter morning and begin to build a fire. "Why do you build a fire?" I ask. "Because it is cold." "What makes you think that a fire will make it warmer?" "Because it did so yesterday, and the day before, and the day before that—because it always has done so in the past." "But what has the past to do with the present and the future? *How do you know that things will behave in the future as they have done in the past?*" I can not answer the question; I do not believe any one can. The past, as Bain says, is separated from the future by a chasm which no resources of logic will ever enable us to bridge.*

* "The most authentic recollection gives only what *has been*, something that has ceased and can concern us no longer. A far more perilous leap remains, *the leap to the future*. All

But while we "can give no reason or evidence" that "what has been will be," that things will behave in the future as they have done in the past—under precisely similar circumstances—the peculiar fact is that we do not want any. When we know that a thing has happened in the past, we are entirely sure that it will, under similar circumstances, in the future—*so sure that we can not help believing it even if we would.*

This is one of the reasons why we may properly call such beliefs necessary—the fact that we can not rid ourselves of them. But while they share this characteristic of inevitableness or necessity with

our interest is concentrated on what is yet to be; the present and the past are of value only as a clue to the events that are to come.

"The postulate that we are in quest of must carry us across the gulf, from the experienced known, either present or remembered, to the unexperienced and unknown—must perform the leap of real inference. 'Water has quenched our thirst in the past; by what assumption do we affirm that the same will happen in the future?' Experience does not teach us this; experience is only what has actually been; and after never so many repetitions of a thing there still remains the peril of venturing upon the untrodden land of future possibility. 'What has been will be,' justifies the inference that water will assuage thirst in after times. We can give no reason or evidence for this uniformity."—*Bain's Logic*, p. 671.

necessary truths, the necessity in the two cases is of a very different character. The necessity of necessary truths is a necessity of *seeing*; the necessity of necessary beliefs is a necessity of believing. We *know* with *absolute certainty* that two straight lines *can* not inclose a space; we *believe* with irresistible strength of conviction that what has been will be, under similar circumstances—not that it *must* be. We can not even think of two straight lines inclosing a space; we can very easily think of this orderly universe becoming a chaos in which there would be an utter absence of law and order, in which combustion would be followed by heat one day, cold another, and so on. The necessity, then, of necessary beliefs is a necessity of belief, not of knowledge. We do not *know*, strictly speaking, that the thing we believe so firmly is true, but we believe it with irresistible strength of conviction, notwithstanding.

Some of our necessary beliefs—for instance, the one we have been considering—have another kind of necessity. If we did not assume that the past would enable us to judge of the future, all rational action would be impossible. Take that belief from the minds of men, and their rational activities would cease as suddenly as though they had been transformed into

stone. I eat when I am hungry, drink when I am thirsty, rest when I am tired—do everything which I do under the influence of that belief. The farmer sows, the mechanic builds, the lawyer prepares his brief, the doctor writes his prescription, because they think that a knowledge of the past enables them to anticipate the future more or less accurately.

The principle, then, that what has been will be, is necessary not only in the sense that we can not get rid of it, but also in the sense that we must believe it in order to live in the world. If a being were born in the world destitute of the tendency or predisposition to accept the past as in some sense a type of the future, he would necessarily perish.

Of necessary beliefs of this class it is absurd to raise the question as to their truth. Though we are not prevented from questioning them by the very nature of our minds—as in the case of necessary truths—still, if we must accept them in order to act and live, the possibility of questioning them will remain a bare possibility.

But if we have beliefs that are necessary in the sense that we can not get rid of them, but not in the sense that we must accept them because of their practical importance, it is evident that the question as to

their truth is altogether in order. A dozen different branches of science—physics, chemistry, physiology, astronomy, etc., as well as Psychology—have shown us very clearly that many of the things which *seem* to be true—and which continue to seem to be after we know they are not—are false. The sun still seems to rise and set, although we know it does not. To call a halt to investigation, therefore, on the threshold of necessary beliefs of this character would amount to an attempt to protect Error against the assaults of Truth.

QUESTIONS ON THE TEXT.

1. What is the relation between the introspective and inferential methods?
2. Why is it important for us to learn what we are conscious of?
3. State the difference between a necessary truth and a necessary belief.
4. Can you doubt a necessary belief?
5. What are the two classes of necessary beliefs?
6. Can you question the truth of a necessary belief?
7. What is the difference in meaning between questions four and six?

SUGGESTIVE QUESTIONS.

1. Make as complete a list as you can of what you regard as necessary truths.
2. What do you suppose the phrase, "Entertain the idea," originally meant?

3. You believe many things because, as you say, you remember them. Are the assertions of memory examples of necessary truths or necessary beliefs or neither?

4. What does Bain mean by the "leap of real inference?"

5. Mention some other necessary beliefs besides the one spoken of in the lesson.

6. Mention some that are necessary in the sense that we can't help believing them, but not necessary in the sense that the nature of the world compels us to assume them.

7. Mention some things that seem to us to be true, although science has shown that they are not.

8. What is meant by the "uniformity of nature?"

LESSON VII.

WHAT ARE WE CONSCIOUS OF?

THE object of the last lesson was to make clear the distinction between necessary truths and necessary beliefs. I tried to show that there are truths that the mind *must see* when it clearly grasps the subject and predicate of the proposition that expresses them. But the mind by no means inevitably sees all the necessary truths it is capable of seeing, because there are subjects and predicates that are beyond its grasp at certain stages of its development, and others that it might grasp, but which, as a matter of fact, it has not grasped. "Seven plus five makes twelve" is a necessary truth. But the child does not see it, because he can not grasp *seven* and *five*. *A necessary truth, then, is not a truth that the mind must see, but which, when it sees, it sees to be necessary.*

Necessary beliefs resemble necessary truths in that we are not only willing, but, in a measure, forced to believe them, in the absence of reason and evidence. Indeed, we are certain both of necessary truths and necessary beliefs; but our certainty differs widely in the two cases. In the one, it is a certainty of know-

ledge ; in the other, of belief. Moreover, the necessity of necessary beliefs, unlike that of necessary truths, is not in all cases absolutely unyielding in its nature. When we look through an opera-glass we can not help seeming to see the object much nearer than it really is. Such irresistible "seemings" we call beliefs until we learn that they are false, but no longer. This is one of a multitude of instances in which what seems to be true is directly opposed to what we know to be true. It would appear, therefore, only a matter of common prudence to accept as true only those necessary beliefs which we can not get along without.

Necessary truths, necessary beliefs, and what we are conscious of, then, constitute the foundation of everything we know and believe, not only about mind, but about the world in general. Now that we know what necessary truths and necessary beliefs are, it will be comparatively easy for us to determine the kind of knowledge that consciousness is, and the kinds of facts of which we are conscious. If we had attempted to learn what consciousness is before making a study of necessary truths, there would have been great danger of our confusing the knowledge of the facts that we are conscious of with the knowledge of necessary truths.

Let us first try to ascertain what that kind of knowledge is that we call conscious knowledge. For to ask what kind of facts we are conscious of is to ask what we know *in precisely the same way, with the same kind and degree of certainty, as we do the facts which every one admits we are conscious of.* Every one admits that we are conscious of the mental facts we know by introspection. Evidently, in order to learn whether we are conscious of anything else, we need to learn whether we know anything else in the same way, and with the same kind and degree of certainty; we need to learn whether our knowledge of any other facts *has the same characteristics as our knowledge of mental facts.* When Columbus first came to this country, if he had been told that certain animals that he saw were buffaloes, he would have had to learn their characteristics in order to be able to recognize buffaloes when he saw them again. Knowing their characteristics, he would have been able to recognize a buffalo as easily as a horse or dog. In like manner, since we are conscious of those facts which we have agreed to call mental facts, we have to learn the characteristics of our knowledge of mental facts, in order to learn whether we are conscious of anything else. For if our knowledge of anything else has the same

characteristics as our conscious knowledge, it also must be conscious knowledge. What, then, are the characteristics of the kind of knowledge that every one admits to be conscious knowledge?

Have you ever been in pain? Suppose that, while you were writhing in agony, some one had asked you if you were sure you had any pain. How do you think you would have answered the question—if, indeed, you had possessed the patience to answer it at all? You would have said, I think, that your certainty was so great that it *could* be no greater. Put so much water into a glass, and not another drop, not an *atom* more can you make it hold. So, you would have said, certainty beyond or greater than yours it was impossible for any conscious being to have. "But may you not be deceived—may not your pain be a mere illusion, like the experiences of your dreams?" your questioner might have asked. "Deceived as to being in pain, when I am literally writhing in agony? *No!* I know it so absolutely that I know that I *can* not be mistaken. There is much that I believe that I realize I may be mistaken in. But this is *certainly*—certainty that admits of no doubt—certainty that makes doubt an absurdity and an impossibility." Conscious knowledge, then, is absolutely certain knowledge—know-

ledge so certain as to make doubt an absurdity and an impossibility.

But this, we have seen, is exactly what the knowledge of necessary truths is. We know that two straight lines can not inclose a space so certainly as to make doubt an absurdity and an impossibility. Is there no difference between the knowledge of necessary truths and conscious knowledge?

If we compare the attitude of our minds towards a necessary truth with its attitude towards a mental fact, I think we shall see a difference. Two straight lines can not inclose a space. Where? In England, on the sun, wherever straight lines are, we know that they can not inclose a space. Our knowledge is not of an individual fact, with which the mind seems face to face, but of an entire class of facts, wherever they may exist. But our knowledge of a pain, for example, although it is like our knowledge of a necessary truth in the *kind and degree of certainty* that it gives us, differs from it in being *knowledge of an individual fact with which the mind seems face to face—of which the mind seems directly aware.*

Conscious knowledge, then, is absolutely certain knowledge of individual facts of which the mind seems directly aware. Instead, then, of asking whether

there are any facts except mental facts that we are conscious of, we can put the question in this form: Are there any facts except mental facts with which the mind seems face to face, and which we know with such absolute certainty as to make doubt an absurdity and an impossibility?

Perhaps, some evening shortly after reading this lesson, you will take a walk. As you glance at the stars shining so brightly above you, you think of the subject of the lesson, and ask yourself if you really are conscious of them. Do you, as you see those little twinkling points of light in the heavens above you, *know* that they exist, so certainly, so *absolutely*, as to make doubt an impossibility?

The fixed stars, as we know, are almost inconceivably far away. They are so far away that astronomers never think of stating their distance in miles. Instead of telling us their distance in miles, they tell us how long it takes light to travel from them to us. Now, light travels about 180,000 miles in a *second*, and the nearest of the fixed stars is so far away that it takes light *three years* to come from it to us. Suppose, then, that the nearest fixed star had been destroyed two years and a half ago. Would you see it to-night? Certainly, just as you see any other star;

for the light that strikes your eyes as you look at it left it two years and a half ago—six months before it was destroyed. And for the same reason you would see it to-morrow night, and the next, and so on for six months. Night after night for six months you would see the star shining above you, although it did not exist at all! When, then, I ask if you *know* that the stars exist as you look at them, evidently the most you can say is that they do, *unless* they have been destroyed since the light left them by which you now see them. But if that is your answer, you can not say that you know that they exist so absolutely as to make doubt an impossibility, for you do not know that they have not been destroyed since the light left them which enables you to see them. Therefore you are not conscious of them.

"But at any rate," perhaps you will say, "I am conscious of the objects about me. I take a walk, and I see the beautiful bouquets of autumn adorning the hill-sides. I see the fields stretching out before me, and here and there a farmer busy at work. As I mark how the leaves of the hedge were nipped by last night's frost, a rabbit suddenly leaps from under my feet, and I wish for my gun as he fairly flies away from

me. Surely," you will say, "you will admit that I am conscious of these things?"

Are you? Put the question to yourself. Ask yourself if you *know* that these things exist so *absolutely* that doubt is an impossibility. Do you like hunting? If so, I am sure you have dreamed of standing behind a trusty pointer, gun in hand, ready to take the first quail that makes its appearance above the weeds. And while you are in the midst of your excitement you awake perhaps to find that you have neither dog nor gun—to find that you have been hunting only in a dream. "What of it?" you ask. This: A certainty quite as great as—indeed indistinguishable from—your waking certainties proved untrustworthy; *may* not your waking certainties be unreliable? You will not, of course, imagine that I doubt that I see and hear the various things which I seem to see and hear, or that I am trying to make you doubt them. I am simply trying to show that you do not know them with the same absolute certainty that you do the *mental* facts of your experience, and that, therefore, you are not conscious of them.

But these arguments, conclusive as they seem to me, are not the considerations which are entitled to most weight. Simply by looking into my own mind,

I know that I do not know the existence of the objects about me with the same kind and degree of certainty that I do the mental facts I am conscious of, and that, therefore, I am not conscious of them.

Look carefully into your experience, and you will see that the only facts which you know with absolute certainty are the facts of your own mental life. You will need no arguments to prove that you *can* not have absolute knowledge of any other individual facts—you will see that you *do* not so clearly as to make argument superfluous. But if you do not, permit me to ask you to hold your judgment in suspense until you have had more experience in the study of mental facts. You would take the opinion of a sailor as to the character of a distant object at sea in preference to your own, simply because of his more extended experience. Inasmuch as trained Psychologists, almost without exception, contend that we are not conscious of the objects about us, I ask you to hold your judgment in suspense until you have studied the subject long enough to give you a right to an opinion.

It seems to me equally clear that we are not conscious of our own bodies. A man with an amputated limb often feels pain in the amputated member, exactly as he does in any other part of the body. But

he can not be conscious of the amputated limb. You admit that. You admit that a man can not be conscious of a leg that has been buried for months. Well, if he *seems* to be conscious of the amputated member and is not, *he has no reason to believe that he is conscious of a member that is not amputated because he seems to be.*

I think we may conclude, therefore, that we know no other individual facts with the same kind and degree of certainty as we do the facts of which we are conscious; and that, therefore, we are conscious of nothing else.

QUESTIONS ON THE TEXT.

1. What is the foundation of all we know and believe?
2. What is the difference between our knowledge of a necessary truth and our knowledge of a mental fact?
3. Are you conscious of the stars? Of the objects about you? Of your own body?
4. Give your reasons for your answers.
5. If you believe that you are not conscious of anything except mental facts, state what you regard as the strongest reason for your opinion.

SUGGESTIVE QUESTIONS.

1. Give examples of necessary truths that are beyond the grasp of a savage.
2. How do you account for the effect of looking at an object through an opera-glass?

3. What is the difference between real pain and imaginary pain?

4. "In this wonder-world a dream is
Our whole life and all its changes,
All we seem to be and do
Is a dream and fancy too.
Briefly, on this earthen ball
Dreaming that we're living all."

What part of these assertions do you *know* to be false?

5. How do you account for the fact that a man often feels pain in an amputated limb?

LESSON VIII.

ATTENTION.

WE have seen that conscious knowledge is that knowledge which we have of those mental facts which we know directly. We have learned also that there are mental facts of which we are not conscious. You remember the example—a student intent upon a book and not hearing the clock strike till a moment after. What is the explanation of such facts? The attention of the student was so fixed upon his book—his entire consciousness was so concentrated upon it—that there was no consciousness left for the sensation. Thus *the sensations of which we are conscious depend upon attention*. In his "Mental Physiology," Carpenter gives some remarkable examples of this. For instance: "Before the introduction of chloroform, patients sometimes went through severe operations without giving any sign of pain, and afterwards declared that *they felt none*: having concentrated their thoughts, by a powerful effort of abstraction, on some subject which held them engaged throughout." "The writer has frequently begun a lecture, whilst

suffering neuralgic pain so severe as to make him apprehend that he would find it impossible to proceed; yet no sooner has he, by a determined effort, fairly launched himself into the stream of thought than he has found himself continuously borne along without the least distraction until the end has come, and the attention has been released; when the pain has recurred with a force that has overmastered all resistance, making him wonder how he could have ever ceased to feel it." A similar experience in the case of Sir Walter Scott is thus recorded by his biographer: "John Ballantyne (whom Scott, while suffering under a prolonged and painful illness employed as his amanuensis) told me that, though Scott often turned himself on his pillow with a groan of torment, he usually continued the sentence in the same breath. But when dialogue of peculiar animation was in progress, spirit seemed to triumph altogether over matter—he arose from his couch, and walked up and down the room, raising and lowering his voice, and, as it were, acting the parts. It was in this fashion that Scott produced the far greater portion of the 'Bride of Lammermoor,' the whole of the 'Legend of Montrose,' and almost the whole of 'Ivanhoe.'"

What we *perceive* depends upon attention. Let a

botanist and geologist take the same walk—and the botanist will see the flowers, and the geologist the rocks, because each sees what he attends to. The next time you take a walk go along the most familiar road in your neighborhood, and see if you can't discover something new to you—some tree or shed that has been there all the time. I have often had that experience. The reason is that these unperceived objects were not attended to.

What we remember depends upon what we attend to. Have you ever thought of it? Most of our past lives is a perfect Sahara of forgetfulness—blank, bleak, barren—swallowed up in oblivion. But here and there gleam little green spots of memory, little oases in the midst of the mighty desert of the past. How is this? The things which we remember are the things which we attend to. Talk to an old man about his past life, and you will find that the events of the last year he but dimly remembers; but when he speaks of his boyhood, the incidents of the time crowd themselves upon him as though they had happened but yesterday. In that far-off happy time, when his heart was light and his mind was free from care, the most trivial events received a degree of attention sufficient to stamp them on his memory forever.

What we recollect depends upon what we attend to. (Recollecting is remembering by an *effort of will*. All recollecting is remembering, but all remembering is not recollecting. Recollecting is a *kind* of remembering.) What do you do when you try to recall the name of a friend which has slipped your memory for the moment? You think of—attend to the thought of—how he looks, of his dress, of some peculiarity in his manner, of the first letter of his name, of some place where you saw him, of something connected with him—until, by and by, his name flashes into your mind. All you did, you notice, was to attend to certain thoughts in your mind.

What conclusions you reach depend upon what you attend you. To Newton, sitting in his garden, the fall of an apple suggested the law of gravitation. Why? Because he fixed his attention upon the resemblance between the fall of the apple from the tree and the revolution of the moon around the earth. The chief difference between the man of great reasoning powers and the ordinary man is that the former notices remote resemblances—resemblances that escape the attention of the latter.

What we feel depends upon attention. The same author already quoted from (Carpenter) gives some re-

markable illustrations of this: The celebrated German mathematician, Gauss, while engaged in one of his most profound investigations, was interrupted by a servant, who told him that his wife (to whom he was known to be deeply attached, and who was suffering from a severe illness) was worse. "He seemed to *hear* what was said, but either he did not comprehend it or immediately forgot it, and went on with his work. After some little time, the servant came again to say that his mistress was much worse, and to beg that he would come to her at once; to which he replied, 'I will come presently.' Again he relapsed into his previous train of thought, entirely forgetting the intention he had expressed, most probably without having distinctly realized to himself the import either of the communication or of his answer to it. For not long afterwards when the servant came again and assured him that his mistress was dying, and that if he did not come *immediately* he would probably not find her alive, he lifted up his head and calmly replied: 'Tell her to wait until I come'—a message he had doubtless often before sent when pressed by his wife's request for his presence while he was similarly engaged."

What we *will* likewise depends upon attention.

Suppose a boy has a lesson to get, and another boy invites him to go fishing. Will he go or will he stay and get his lesson? That depends on what he attends to. If he allows his mind to dwell on the fun he will have, if he does not permit himself to think of the consequences of neglecting his work, he will go. But if he keeps his mind firmly fixed on the consequences; if he vividly realizes the displeasure of his parents, the disapprobation of his teacher, the probability of losing his place in his class, he will stay.

This brief survey will enable us to form some idea of the importance of the part which attention plays in our mental life. I think you see that the chief difference between the educated and the uneducated man is the greater capacity of the former for close, continuous, concentrated attention. Some writers indeed have gone so far as to say that genius depends entirely on the power to concentrate the attention. Newton thought that the sole difference between himself and ordinary men consisted in his greater power of attention. This, I think, is an exaggeration. But however this may be, I think that the importance of training the attention can scarcely be over-estimated.

How can we train the attention of our pupils? Precisely as we cultivate any other power of their

minds—by getting them to attend. Our pupils learn to observe by observing, and to think by thinking, and to attend by attending. We never make the mistake of assuming that our pupils have a high degree of reasoning power when they first go to school—that they are capable of solving difficult problems in arithmetic, or understanding abstract statements in grammar—and it is just as absurd for us to suppose that they are capable of continuous attention, and yet we are prone to do that. “Because people are attentive, when strong interest is roused”—says Edward Thring—“there is a common idea that attention is natural, and inattention a culpable fault. But the boy’s mind is much like a frolicking puppy, always in motion, restless, but never in the same position two minutes together, when really awake. Naturally his body partakes of this unsettled character. Attention is a lesson to be learned, and quite as much a matter of training as any other lesson. A teacher will be saved much useless friction if he acknowledges this fact, and instead of expecting attention which he will not get, starts at once with the intention of teaching it.” How can he teach it? That question it is of the utmost importance for us to be able to answer.

QUESTIONS ON THE TEXT.

1. Show (*a*) that the sensations of which we are conscious depend upon attention; (*b*) that what we perceive depends upon attention; (*c*) that what we remember depends upon attention; (*d*) that what we recollect depends upon attention; (*e*) that what we believe depends upon attention; (*f*) that what we feel depends upon attention; (*g*) that what we will depends upon attention.
2. Illustrate your answers from your own experience.
3. Illustrate the difference between remembering and recollecting.
4. How is the power of attention to be acquired?

SUGGESTIVE QUESTIONS.

1. "The botanist sees much in a plant; the horse-dealer in a horse; the musician hears much in a piece of orchestral music, of whose presence in the sense-perception the layman has no idea. From the same story each hearer interprets something different; out of the same laws each party interprets its right; the same turn of battle is proclaimed by both armies as a victory; out of the same book of nature the different readers, men and people, have gathered the most diverse things." (Volkmann.) How would you explain these facts?
2. Account for the truth embodied in the proverb, "There are none so blind as those that *won't* see."
3. Account for the use of *mind* in the following sentence: "I can't put my mind on anything to-day."

LESSON IX.

ATTENTION.

IN the last lesson I tried to make it clear that our entire mental life is controlled by attention, in order that we may realize that the beginning of teaching is getting the attention of our pupils, and that the end of education is the developing of powers of attention, and directing those powers into right channels. An inattentive mind is an absent mind; and, as Thring remarks, a teacher "might as well stand up and solemnly set about giving a lesson to the clothes of the class, whilst the owners were playing cricket, as to the so-called class" if they were inattentive. Moreover, as the character of the mind depends upon the things it attends to, and the manner in which it attends to them, evidently the object of education is to develop the power of attending to the right things in the right way.

But what is attention? When you are reading an interesting book, you are scarcely conscious, if at all, of the sensations of pressure produced by your chair; carriages and wagons are clattering along the street, but you do not note them; various objects are directly

before you, but you do not see them. Indeed, you are but dimly conscious of the sensations produced by the very type of the book you are reading. But the thoughts called to your mind by your book stand out clearly and conspicuously in your consciousness—every feature, as it were, sharply defined. The act of the mind by which certain facts in our experience are thus emphasized and made prominent is called attention. *Attention, then, may be defined as that act of the mind by which we bring into clear consciousness any subject or object before the mind.* When you say to your pupils "Give me your attention," you mean that you want them to stop thinking of the game they played at recess, of the book they read last night, of everything except what you are saying.*

*"Clear consciousness may be thought as the circle of those concepts"—experiences—"upon which attention rests. Experience shows us that this circle, like the pupil of the eye, can be extended or contracted within certain rather wide limits. The greatest narrowing occurs when we concentrate our attention upon a single object—as, for example, when we become absorbed in thought, or narrowly observe an outward phenomenon; the greatest extension takes place when we widen the bounds of the narrow consciousness to its greatest extent, in which case there would be really no concentration of mind and no attention. It is apparent that the width of the circle is indirectly proportioned to the clearness of its single points—i. e., that our attention is so much the less intensive the more extensive it is."—*Lindner's Psychology*, page 11.

Making another study of our experience, we find that there are two kinds of attention. You are reading a difficult and not very interesting book, when some one in the next room begins to sing your favorite song. You do your best to keep your attention on your book, but your mind wanders to the song in spite of you. Or you go to a lecture just after reading a letter that contained some very good news. You try to listen to the lecture, but the thought of the letter persists in dragging your mind away. In both these cases you are conscious of two very different kinds of attention—attention depending upon the will, or voluntary attention, and attention independent of the will, or non-voluntary attention.

We can see the difference between them more clearly, perhaps, if we bear in mind that, in the case of non-voluntary attention, there is but one thing that influences the mind—the thing attended to; while in voluntary attention there are two—the thing attended to, and some reason or motive for attending to it. When you listen to a song simply because you like it, you attend involuntarily; when you keep your mind fixed upon a book by an effort of will, you attend voluntarily. In the first case, there are but two things—your mind and the song; in the second,

there are three—your mind and the book, and some reason or motive for attending to it. In the first case, you attend because of the attraction which the song has for your mind *directly*; in the second, you attend not because of any attraction which the book has for your mind, but because of *its relation to something else that attracts you directly*, as the desire to improve. Non-voluntary attention, then, is *that attention which results from the influence exerted upon the mind by the thing attended to, in and of itself*; voluntary attention is *that which results from the influence exerted upon the mind, not by the thing attended to, but by the knowledge of its relation to something else that attracts the mind in and of itself*.

It is evident that voluntary attention is impossible without some variety of experience and some mental development. To attend voluntarily, we must perceive relations; and to perceive relations, the mind must have had experience, and must be developed enough to interpret that experience. A bath may, almost from the beginning, give a child pleasant sensations. But his mind must be developed enough to perceive the relations between the preparations for his bath and the bath before the sight of the former can give him pleasure. Moreover, it is evident that the child must

not only have had experience of relations in order to regard one thing as the sign of another; he must have not only some development of intellect to be able to connect things together, but also some development of his capacity for feeling, in order to be able to form ideas of things desirable in themselves. When the child is able to form the idea of a thing desirable in itself, and to see the connection between such a thing and something undesirable, the latter begins to be interesting *because of its relation to the former*—the conditions of voluntary attention exist.

This analysis of the circumstances under which voluntary attention is possible prepares us to anticipate what observation confirms—that very young children are incapable of voluntary attention. Indeed, it seems probable that in the first days of a child's life there is no attention of any kind. The mental life of a new-born child seems to consist of a mass of confused sensations, none of them coming into clear and distinct consciousness, because none of them are attended to. But the quality of some of its sensations, their character as pleasant or painful, causes the sensations that possess it to be emphasized in the child's experience. Bain well says that "enjoyment, "ate and incessant, is a primary vocation of the

infant mind." "In the presence of the more enjoyable, the less enjoyable is disregarded." "Attention lasts so long as enjoyment lasts, and no longer."* So far as a child is under the influence of pleasure alone, these statements are true without qualification. But pain has fully as strong a hold on attention as pleasure. Moreover, as the same author remarks, "Intensity of sensation, whether pleasant or not, is a power." A bright light, a loud noise, "take the attention by storm." But in considering the effect of intensity of sensations upon attention, we must bear in mind that the greater their relative intensity—the greater, in other words, the contrast between the sensation and the other experiences of the child—the stronger will be its influence in attracting his attention. A remark made in an ordinary tone, for example, when it breaks in upon absolute stillness, will attract attention more strongly than one made in a very loud tone in the midst of noise and confusion.

Under the influence of these two causes—the quality of sensations or their character as pleasurable or painful—and their intensity, absolute and relative, the child's power of attention develops with wonderful rapidity.

* Bain's "Education as a Science," page 179.

As long as he is capable only of non-voluntary attention, he is at the mercy of his impressions. As the course of a stream depends upon the slope of the ground, so the direction of his attention depends upon the attractiveness of his sensations.

But the exercise of non-voluntary attention develops the power to attend voluntarily. Every exercise of non-voluntary attention makes that kind of attention easier. Sensations less and less intense—sensations whose pleasurable or painful character is less and less pronounced—have power to attract it, in accordance with the universal law of the mind that exercise develops power. While the child's power of non-voluntary attention is in this way increasing, his growing experience is leading him to form *ideas* of things he desires, and to perceive the relation between the things that give him pleasure and the means of gratifying his desires. When this relation is clearly perceived, all the conditions of voluntary attention exist.

Probably the first exercise of distinctively voluntary attention usually occurs when the child is from three to six months old. Professor Preyer reports an instructive experiment as made by Professor Lindner upon his little daughter, twenty-six weeks old, which

experiment proves conclusively that the child was exercising voluntary attention:

"While the child, at this age, was taking milk as she lay in the cradle, the bottle took such a slant that she could not get anything to suck. She now tried to direct the bottle with her feet, and finally raised it by means of them so dexterously that she could drink conveniently. This action was manifestly no imitation; it can not have depended upon a mere accident; for when, at the next feeding, the bottle is purposely so placed that the child can not get anything without the help of hands or feet, the same performance takes place as before. Then, on the following day, when the child drinks in the same way, I prevent her from doing so by removing her feet from the bottle, but she at once makes use of them again as regulators for the flow of the milk, as dexterously and surely as if the feet were made on purpose for such use. If it follows from this that the child acts with deliberation long before it uses language in the proper sense, it also appears how imperfect and crude the deliberation is, for my child drank her milk in this awkward fashion for three whole months, until she at last made the discovery one day that, after all, the hands are much better adapted to service of this sort. I had given strict orders to

those about her to let her make this advance of herself."

We must not forget to note that the conditions of voluntary attention were completely fulfilled in this case, and that it was only through this that the child's action was possible. If the child had not known by experience the relation between certain movements and the effects of those movements, she would not have been able to attend to those movements—in themselves uninteresting—in order to get hold of her bottle. And if her experience had not enabled her to form an idea of her bottle as a thing that gave her pleasure, it would not have been possible for her to fix her attention upon certain movements as a means of experiencing that pleasure.

QUESTIONS ON THE TEXT.

1. Why is it so important for you to know the conditions of attention?
2. Illustrate and define the two kinds of attention.
3. State and illustrate the conditions of voluntary attention.
4. Show that these conditions can not be fulfilled in the case of a very young child.
5. Describe as clearly as you can the consciousness of a new born child.
6. What are the two causes of non-voluntary attention in a child's experience?

7. Show how the conditions of voluntary attention are gradually developed.

8. Analyze the voluntary attention exercised by Professor Lindner's child for the purpose of showing that the conditions of voluntary attention were fulfilled.

SUGGESTIVE QUESTIONS.

1. Account for the miser's love of money.
2. Account for the knowledge of Professor Lindner's child.

3. Make a study of any children you know of from two or three months to six or seven years of age in order to ascertain (1) the kind of objects that attract their non-voluntary attention; and (2) the lines of interest that control their voluntary attention after they are capable of exercising it.

4. President G. Stanley Hall says: "It is a striking fact that nearly every great teacher in the history of education who has spoken words that have been heeded has lived for years in the closest personal relations to children, and has had the sympathy and tact that gropes out, if it can not see clearly, the laws of juvenile development and lines of childish interest." (a) Who are some of the great teachers of whom he speaks? (b) In what way do you think their personal relations to children were helpful to them? (c) Do you know any important educational questions that can be best solved by a careful and systematic study of children? (d) Why is it important to know the "laws of juvenile development?" (e) Why the lines of childish interests?

5. Professor Preyer's child gazed steadily at his own image in the glass when he was about four months old. Was that a case of voluntary attention?

LESSON X.

ATTENTION.

COMPAYRE says that the way to teach the child to be attentive is to supply the conditions of attention. Nothing can be truer. But in order to do this, as he remarks, we need to know what the conditions of attention are.

To ascertain the conditions of non-voluntary attention was the object of the last lesson. We did, indeed, confine our investigations to the first years of childhood; but, as G. Stanley Hall remarks, "the living, playing, learning child . . . embodies a truly elementary Psychology." If, then, we were right in concluding that the two laws of non-voluntary attention—the two conditions upon which it depends in childhood—are the pleasurable or painful character of the child's experiences, and their intensity, we have reason to hope that we know the conditions that we need to supply in order to get non-voluntary attention. No matter what grade of pupils we are dealing

we shall be quite sure of this if, pursuing

our usual course, we make a study of our own experience and the experience of those about us. Why do you find it easier to listen to a speaker when you can see him than when you can not? Because when you see him you have a much more vivid—intense—impression of him than you have when you do not. Why is it that to *see* a dentist extract the tooth of a friend affects you so much more strongly than to *think* of the same thing? Because the perception of a person in pain is a much more vivid experience than the thought of one. Why is it that pupils find it so much harder to attend to a teacher who speaks in a drawling, monotonous tone, than to one who speaks in a quick, lively, animated manner? Because the latter makes more definite impressions upon the mind. The monotonous speaker, moreover, is an unemphatic speaker; and in the absence of emphasis—of impressions having the character of intensity—there is nothing to particularly attract our attention to the leading idea, so that it is much harder to learn what that idea is. Why is it that you can remember an argument that you understand so much better than you can one that you do not understand? Because, when you understand an argument, you perceive the relations between its various parts; and the perception

of relations is a source of pleasure, and therefore a stimulus of attention, and hence a help to memory.

It appears, then, that in learning the conditions of non-voluntary attention in the early years of a child's life, we have learned what they are throughout the whole of his life. Some writers speak of novelty as a condition of non-voluntary attention, and under some circumstances it undoubtedly is. But why? Because the novel is the unexplained, and the unexplained excites our curiosity. But curiosity stimulates thought, and the exercise of the power of thinking, under normal circumstances, is a source of pleasure. In a word, the novel attracts our attention because of the pleasurable character of the experiences connected with it. To prove this, we only need to recall the fact that, when we see a novel thing under such circumstances as not to excite our curiosity, it does not attract our attention. To the mind of a man who knows nothing of machinery, a complicated machine, however novel, offers no attraction. Indeed, a man who knew nothing of machinery would not know, without being told, that a particular machine was novel, unless its new features were of a very striking character. His ignorance of machinery would make it impossible for him to see the difference between the novel machine

and those he was in the habit of seeing. If its new features were of such a striking character that he could not fail to notice them, he would regard it with a sort of vague wonder, but not with that keen, active curiosity which is such a powerful stimulus to the attention. That is why the entirely familiar and the entirely unknown* are equally destitute of interest. Neither of them offers to the mind a problem to be solved; neither of them lures to exertion with the anticipation of a conquest over difficulties. The entirely familiar does not stimulate thought because it is, or seems to be, the entirely known; the entirely unknown does not, because it offers to the mind nothing that it can take hold of. It is like a new ball of string, carefully wound up, with the ends so well concealed that there seems no way of beginning to unwind it.

So, again, the physical conditions of attention are insisted on, and, as we all know by experience, with entire propriety. When you are sick or tired, you can not attend as you can when you are well and rested. But why? Because things do not interest you so much.

*Of course it will be understood that I use the phrase "entirely unknown" relatively. Strictly speaking, the entirely unknown could not come before the mind at all.

The relations between body and mind are so close that the mind is incapable of intense interest when the body is exhausted. That attention, then, is strongly influenced by bodily conditions is indeed true ; but it is no new law ; it is simply a case under the law already considered, that that which interests us, whether by its pleasurable or painful character, attracts attention.

We may conclude, then, that we have found what we are in search of, so far as non-voluntary attention is concerned—the conditions which we must supply in order to get it.

Let us now see how the case is altered by voluntary attention. As a matter of experience, how does the will influence attention?

Going to your room, you find a half dozen books on your table. There is "Vanity Fair," a volume of Tennyson's poems, Stanley's "Dark Continent," "Looking Backward," a history of England, and a text-book on Geometry. Which will you read? If you were capable only of non-voluntary attention, you would read the one which attracted your attention most strongly. There would be a struggle between competing attractions, and the strongest would win the day. But through the influence of your will you

may give your attention to precisely that subject which you like least. You don't like mathematics, but as you are going to be examined in geometry, you begin to study that. Can you keep your attention on it *simply* by an effort of will? Certainly not. The will simply determines the direction in which the mind looks; but if it continues to look that way, it must find something to interest it—something to attract its non-voluntary attention. The will determines, in this case, that the attention shall be put on geometry; but if it stays there, it is because the subject develops some interest for the mind—stimulates its non-voluntary attention. Sully puts this very clearly: "By an act of will I may resolve to turn my attention to something—say a passage in a book. But if, after this preliminary process of adjustment of the mental eye, the object opens up no interesting phase, all the willing in the world will not produce a calm, settled state of concentration. The will introduces mind and object—it can not force an attachment between them. No compulsion of attention ever succeeded in making a young child cordially embrace and appropriate, by an act of concentration, an unsuitable and therefore uninteresting subject. We thus see that voluntary attention is not removed from the sway of interest,

What the will does is to determine the kind of interest that shall prevail at the moment."

The last sentence states the work done by the will in attention very exactly. It creates no new influence; it simply determines which of pre-existing influences shall have control over the mind. Co-operating *with* a pre-existing influence, the will can make a weaker one prevail over a stronger. Without a prevailing influence to work on, the will is as powerless as a lever without a fulcrum.

But, upon second thought, have we not put this too strongly? , Does voluntary attention always require a *pre-existing* influence in order to be effective? I do not think so. If the will resolutely turns the gaze of the mind upon a certain subject, points of interest, before unnoticed, may present themselves. The interest which alone makes concentration of mind possible may *result from* the exercise of the will, instead of existing before it. As the persuasions of a friend may induce you to consent to be introduced to a person who does not attract you, and whom you think you will not like, so the exertion of the will may induce you to attend to what you otherwise would not have to, because it revealed no attractions to such glances as, without interest, are only given,

except in voluntary attention. Precisely as your new acquaintance may develop elements of attractiveness which you never would have known anything about if you had not consented to an introduction, so an uninteresting subject may become interesting under the searching gaze of voluntary attention, which otherwise would have remained uninteresting forever. And this is one of the functions of voluntary attention—to develop interests, to make us acquainted with interesting subjects, of which we should have otherwise remained ignorant.

But there is another, of quite as much importance. What we call concentration of thought is a continuity of attention to the same subject. But this continuity is by no means insured when, under the influence of the will, the interests of a certain subject are present to the mind. If the will relaxes its hold upon the activities of the mind, the attention is liable to be carried away by any one of the thousands of ideas that the laws of association are constantly bringing into our minds. As you use your will to give your attention to geometry, although it attracts you less than a number of other subjects, so, if you really *study* it, you use your will to prevent your mind from being dragged away from it by the interests that are constantly im-

portuning you. He who possesses this power in a high degree possesses in a high degree the power of voluntary attention. This, then, is another function of voluntary attention—to give steadiness to the mind, to prevent it from going capriciously here and there under the influence of the interests that happen to be present at the particular moment.

If the interests of the mind are the chief condition of non-voluntary attention, and if voluntary attention, to have any educational value, must start from, or result in, interests, we can put the two questions in which, as teachers, we are interested, in a more definite form. What is the end or object of education? What is teaching? The object of education, we have said, is to develop the power of attending to the right things in the right way; to teach is to get and keep the attention of our pupils by bringing their minds into contact with subjects that have an educational value. The one is the goal—the other seems the path by which we must reach it. The one is the end—the other seems the means by which we must attain it. But we now see that to develop the power to attend to things in the right way is to develop certain rests in the mind, and to give it the mine, at any particular time, the in-

terests by which the current of its thoughts shall be directed. We see also that, to get and keep the attention of our pupils by bringing their minds into contact with subjects that have an educational value, we must make those subjects interesting; we must give their wills a fulcrum upon which to work. We may then state our two great questions in this form: (1) How can we develop those permanent interests that shall induce the mind to attend to the right things in the right way? (2) How can we interest our pupils in the subjects we teach? Stated in this compact form, we see that we can not answer the first by answering the second. Life is larger than the school. When we have done all we can to make the subjects they study interesting to our pupils, the interests we have developed will have to compete with other interests, which the work of the school touches but indirectly and remotely. It will always remain possible for their wills to choose to foster the interests that check the growth of those we wish to make permanent. Moreover, the school is larger than the recitation. There are other influences—discipline, for example—which we can bring to bear upon the will besides those that directly result from the recitation.

QUESTIONS ON THE TEXT.

1. What are the two conditions of non-voluntary attention in the case of children?
2. Show that they are universal conditions of non-voluntary attention.
3. Why is it that novelty sometimes attracts our attention and sometimes fails to do it?
4. Show that the influence of novelty is a case of one of the two conditions already discovered.
5. Show that the influence of bodily conditions upon the attention is not a distinct law of attention.
6. State and illustrate the influence of the will upon attention.
7. What are the two functions of voluntary attention?
8. What is the most definite form in which you can state the two great questions which as a teacher it is your business to answer?
9. What is the difference between them?
10. Why is it so hard to understand unemphatic reading?

SUGGESTIVE QUESTIONS.

1. The end of education is often said to be "symmetrical development." In this lesson I say it is the development of certain permanent interests in the mind, etc. Are the two answers consistent?
2. "A few years ago, a gentleman brought two Eskimaux to London—he wished to amuse and at the same time to astonish them with the great magnificence of the metropolis. For this purpose, after having equipped them like English gentlemen, he took them out one morning to walk through the streets of London. They walked for several hours in silence; they expressed neither pleasure nor admiration at anything which they saw. When their walk was ended, they

appeared uncommonly melancholy and stupified. As soon as they got home, they sat down with their elbows upon their knees and hid their faces between their hands. The only words they could be brought to utter were, 'Too much smoke—too much noise—too much houses—too much men—too much everything!' "—*Edgeworth's Practical Education. Account for the state of mind of the Indians.*

3. Under the influence of the intensity of his interest, the whole mind of an orator, in the midst of an oration, is brought to bear upon his subject. Ideas and images not connected with it do not come to his mind—as though for the time he had forgotten everything in the world except a certain group of related facts and ideas. Is this concentration of thought voluntary or involuntary attention?

LESSON XI.

ATTENTION.

WE have seen that voluntary attention is not "removed from the sway of interests," but that, to have any educational value, it must start from or lead to interests; that the two functions of voluntary attention are (1) the development of interests in things that would never give us pleasure were it not for voluntary attention; and (2) the development of the power of continuous attention, that the mind may direct its own energies—that it may not be a mere instrument, producing nothing but inharmonious sounds, because played upon by every passing impulse. From this point of view we were able to see that the object of education is the development of certain permanent interests, and of the power to determine the course of one's activities; also that true teaching consists in bringing the mind into contact with subjects that have an intellectual value, in such a way as to make them interesting. This latter, as we know, is another way of saying that true teaching consists in getting and keeping the attention of our pupils, and making the right use of it.

Beginning, then, with the simpler question—How can we get and keep the attention of our pupils? Comenius answered that question with remarkable completeness nearly three hundred years ago. In his time it was the custom to teach boys separately, or not more than two or three at a time. He contended that a lecturer could hold the attention of a large class just as well (1) “by always bringing before his pupils something pleasing and profitable; (2) by introducing the subject of instruction in such a way as to commend it to them, or by stirring their intelligences into activity by inciting questions regarding it; (3) by standing in a place elevated above the class, and requiring all eyes to be fixed on him; (4) by aiding attention through the representations of everything to the senses, as far as possible; (5) by interrupting his instruction by frequent and pertinent questions—for example, ‘What have I just said?’ (6) if the boy who has been asked a question should fail to answer, by leaping to the second, third, tenth, thirtieth, and asking the answer *without repeating the question*; (7) by occasionally demanding an answer from any one in the whole class, and thus stirring up rivalry; (8) by giving an opportunity to any one to ask questions when the lesson is finished.”

The hastiest glance at these rules will enable us to see that the teacher who conforms to them supplies the conditions of *both* voluntary and non-voluntary attention; and we need to carefully note the fact that we must do it if we hope to get and keep the attention of our pupils. A teacher who imagines that his work is done in this direction when he *interests* his pupils—in other words, when he supplies the conditions of non-voluntary attention—is sadly mistaken. He can not get their non-voluntary attention until he begins to interest them; and he can not keep it afterwards simply by being interesting. *Until* he interests them, their attention, so far as it is non-voluntary, will be given to the most interesting thing that happens to come before their minds. *After* he interests them, instead of keeping their attention on what he *is* saying, they will continue to think about some interesting thing he *has* said, until their attention is attracted by something else.

In complying with a part of the first rule—in bringing before our pupils something pleasing—we are evidently supplying the conditions of non-voluntary attention by the *matter* of our instruction; in complying with a part of the second—"stirring their intelligences to activity by inciting to questions re-

garding it"—we are doing the same thing by the *manner* of our instruction; and the same is true of the fourth and eighth rules.

In bringing before our pupils something which they feel to be profitable; in teaching it so as to commend it to them; in occupying a position where we can see the entire class (a position that will make them feel that the teacher will be likely to know if they permit their minds to wander); in frequently calling upon them to reproduce what we have just said; in asking our questions promiscuously, without repeating them, when an incorrect answer is given—we are supplying the conditions of voluntary attention, giving them reasons for attending apart from the interest of the matter to which we wish to call their attention.

Every one of these rules for getting the voluntary attention of pupils is important; but I wish especially to call attention to two or three of them. Of the fifth I will only remark that *no* teacher, below the university, who does not practice it habitually, has the attention of a majority of his pupils, no matter what grade of pupils he teaches. Moreover, unless some such rule is observed, it is hard to see how a teacher can be sure that his pupils understand him. We shall miss half of the importance of the first rule unless we bear

in mind that when we can not see our pupils, they can not see us. What a hindrance that is to attention we shall realize if we try to listen to a speaker when we can not see him.

But it is of the first and second rules that I wish particularly to speak. The more I think of it, the more I am convinced that the neglect of them is one of the principal causes not only of inattention in classes, but of a dislike for the work of the school in general. We too often fail to inform ourselves of the *educational value* of the subjects we teach. It too often happens that the best reason we can give for teaching geography, grammar, arithmetic, etc., is that we were taught them. Now, when we don't know why we require our pupils to study this and that subject, is it any wonder that our pupils don't know why they are required to study them? Boys know very well that they could spend their time to advantage if they could use it as they liked. They could go fishing or hunting or skating, and have lots of fun. They could work and get money, and have more fun. These things a boy *knows*. Is it any wonder that he does not like to go to school, when he has never been made to feel the value of an education? Is it any wonder that he makes no effort to keep his mind from wander-

ing when the teacher is talking about a lot of "stuff," as he calls it, because he has never been made to appreciate its value? "Is he to sit and toil day by day, and let the sun shine upon hill and dale, and he not see it? And let it gleam along the rivers, and glance in and out of the forest trees with scattered joyousness, and he not see it? Is he to miss the freshness of the air, the games, and the thousand and one delights that pass through the kaleidoscope of the boy mind, so fertile in fancy, so free? And all for what?"* For nothing, so far as he knows, unless he has been made to feel the value of an education. If you expect him to work, if you expect him to attend to you, you must make him understand, so far as you can, that it is a reasonable thing for him to do what you require. And you must make him realize what knowledge costs. Show him a map of Africa made twenty years ago, and show him a map of Africa as it is known to-day. Tell him of the toil and privations and hardships that Livingstone underwent to make the difference. Let him know, make him feel, that the knowledge which he can get so easily at school is the "piled up" life of some of the greatest and noblest men of the race. It is so easy to read that "the earth is round because men have sailed

* Thring's "Theory and Practice of Education."

around it." But Drake and Raleigh and the other men who were among the first to make the voyage did it at the risk of their lives. Some of them, leaving pleasant homes and wives and children that they loved, exposed themselves to unknown dangers—the result of it all is a single line.

But if we put Comenius' rule fully into practice, our pupils will learn to value education not merely for what it will *bring* them, but for what it will *make* them. They realize the difference between the boy who can read and one who can't. The boy who can't read sees nothing but a piece of paper with black lines of all sorts and shapes upon it. But the boy who can read sees not merely paper with letters upon it, but the very mind of the man whose thoughts are materialized on the page before him. Make him feel that he possesses other dormant powers that you are trying to develop; make him feel that education will not merely give him better tools to use, but increase his power and skill in using them; make him feel that every lesson you assign is intended to lead to this end, and he will *try* to attend, whether he succeeds or not.

But to insure that his efforts will be successful, we must give his will a fulcrum upon which to work—we
it develop interests,

The great secret of interest is adaptation. The toys and playthings and pictures of a child amuse him because they are adapted to his state of development—they stimulate him to exercise his powers. What we must do in teaching, if we expect to interest our pupils, is to set them to do something that they are able to do, in order that they may acquire the power to do what they can not do. We should constantly be striving at every stage of a child's development to learn the contents of his mind—to make an inventory of his capacities, so as to see which of them we can turn to educational account, and how. And here again we come upon the fact that meets us at every turn and corner of our experience in teaching—the necessity of a constant, careful, systematic study of our pupils, if we hope for the best success in teaching them. Unless we know them *thoroughly*, we can not adapt our teaching to them perfectly.

We all know that we can keep the attention of our pupils better by asking questions than we can by doing all the talking ourselves. The reason is found in the law of adaptation. When we are asking questions we are making the utmost use of the impulses of curiosity and activity. Children like to learn things, and they like to act. Ask the right kind of questions, and you

make them conscious of their ignorance—you stimulate their curiosity. But here again the necessity of studying the minds of our pupils presents itself. The curiosity of little children is very different from that of older pupils. A child asks a question, and before you have answered it he asks another about an entirely different subject. His question was the result of involuntary attention; and since his interest in things in the form of curiosity is very slight, like a bird he flits from this subject to that, never staying with one thing a minute at a time. But this, as we know, is one of the things which we want to develop—this power of attention. So you will try to help him attend more and more closely to a subject, and to follow out a line of thought more and more persistently. When he asks a second question before you have answered the first, you will neither show nor feel impatience—no more than a mother does that her child is born without teeth. You will ask him questions about the first thing, keeping his mind upon it as long as you think it safe, learning a lesson from the bird, who does not encourage her young to make long flights the first time. You will be satisfied if you can make his curiosity a means of getting him to think a little and learn a little, being sure that in this way you can deepen it,

and so get him to think more closely and acquire more knowledge.

It is due to the same principle—that what is adapted to us interests us—that to pupils the most interesting thing is the manifestation of that intense form of interest in the teacher that we call enthusiasm. Arthur Sidgwick well says: “Whether it be school lesson or subject of common talk out of school, the enthusiast drags the boy’s mind captive. He makes him attend, he makes him interested, he makes him think. Without trying to do so, he makes learning seem attractive and delightful. Boys are naturally impressionable, and enthusiasm impresses; they are naturally imitative, and whatever they see a man keen about, they at once begin to excite themselves about it. Whether it be poetry, history, politics, art, science, natural history, or archæology, the enthusiast will at once make a school of his own imitators about him. And he will do far more than this. He will lift boy after boy out of the barbarous intellectual atmosphere in which the natural boy lives and moves, and make him conscious—though it be only dimly conscious—of the vast world of interest which lies around in every direction, waiting till he gird up his mental loins and come to explore. This is the real

result of a master's enthusiasm—it cultivates. Under plodding, hum-drum teachers, who will not put soul into their work, a boy may pass through a school from bottom to top, doing all the work so as to pass muster, and be a savage at the end. But let the enthusiast catch him, though but for a term, and the savage is converted.”*

I can not forbear quoting what another English teacher says on the same subject: “To find the lesson oozing, as it were, from your finger tips; to be so full of your subject that the question is not what to say, but what to leave out; and to feel so well and vigorous that your vivacity compels attention and interest, and makes the faces in front of you look bright contagiously—*that* is how to prepare the lesson. . . . The story (told by the Professor at the Breakfast Table, I think) of a tailor lamenting over a customer departing empty-handed, that if it were not for a headache he would have a new coat on that back in spite of himself, is freighted with truth. There is a magnetic influence passing from a healthy and alert mind to all with whom it comes in contact; that influence is the teacher's conjuring wand, and without it he will never bring the dry bones of education to

* “The Practice of Education,” page 63.

life. It will readily be seen that no patent process for the production or maintenance of this influence can be found. It is best fostered by variety of life; by a wide experience of men and things (not at all an easy thing for one so closely tied as a teacher to attain); in short, by anything that tends to keep the heart and mind open, and to make life interesting. Teachers lead too often very dull lives, and the dullness reacts on their pupils. Men and women who have to give out so much can hardly lead too full and rich and interesting lives. Their minds ought to be a storehouse of thoughts and pictures and recollections, from which they can draw at will to enrich their lessons and to furnish the minds of their pupils."

It is indeed true that enthusiasm is a gift of nature conferred on but few teachers. But there is a degree of interest within the reach of every one of us, if we are willing to work for it. There is no danger that we shall lack interest in our subjects if we study them. When we think we know so much about them that it is not worth while to study them any more, that very fact proves that we are lacking in interest. *But interest in our work is quite as essential to success in teaching as knowledge.*

QUESTIONS ON THE TEXT.

1. Summarize the results reached in the preceding chapters on attention.
2. State the rules given by Comenius, and show how each of them is related to the laws of attention.
3. Show that a teacher must supply the conditions of both voluntary and non-voluntary attention.
4. What is meant by "education values?"
5. What can we do to commend the subjects we teach to our pupils?
6. What is the secret of interest?
7. Describe the curiosity of little children, and state what should be done to deepen it.
8. What is an important object of questioning older pupils?
9. Explain and describe the effect of enthusiasm in awakening interest.
10. What is the point of the story told by the Professor at the Breakfast Table?

SUGGESTIVE QUESTIONS.

1. Dr. Arnold said: "The more active my own mind is, the more it works upon great moral and political points, the better for the school." Account for the fact.
2. Account for the influence of Sheridan at the battle of Shenandoah.
3. Describe the Socratic method of teaching, and account for its stimulating effect.
4. What are the education values of arithmetic, geography, grammar, and United States history?
5. Make a study of children, as you have opportunity, to ascertain the character of their attention—whether (a) it is easily distracted, or (b) hard to transfer from one subject to another.
6. What use can you make of that kind of knowledge of *children*?

LESSON XII.

ATTENTION.

IN the last lesson we considered the question as to what we should do to keep the attention of our pupils during recitation. The wider question—the question as to the other means at our command to help us in cultivating the power of attention—has yet to be examined.

We learned from Comenius that one of the ways of keeping the attention of our pupils during recitation is to encourage them to ask questions; and we know that the reason for that is that in this way we stimulate their curiosity, and give them the pleasure of mental activity. But our observations of children have enabled us to see that the curiosity of very young pupils is not strong enough to incite them to hard work. When they ask us questions, or when we ask them questions that they can not answer, if we do not answer them at once, they stop thinking about them, because they have so little curiosity.

But when we are dealing with older pupils we should make a different use of the principle of curi-

osity. Their curiosity is strong enough to stimulate them to harder work. You can get their attention by asking questions that will make them conscious of their ignorance; and the realization of this fact will often be a sufficient motive for vigorous exertion.

When you should answer your question your own tact must determine. It often happens that a student has interest enough in a subject to be clearly conscious of the labyrinth of difficulties in which the questions of his teacher have involved him, but not enough to make him willing to undergo the labor of threading his way out. Now, while we ought not to remove difficulties that have not been realized, or which the pupil's interest might induce him to overcome, there are circumstances under which the clearing up of difficulties may greatly increase his interest, and thus put him in the way of a more vigorous and protracted exertion of his powers. When the subject under consideration lies before his mind wrapped in a fog, a few direct, luminous, incisive statements from you, like a brisk wind, may clear away the fog and reveal the outlines of the country sharp and clear to your pupil's mind.

You may thus give him that experience that can be felt, but can not be described—that delightful consciousness of power which he realizes when, instead of

groping in darkness in an unknown country, he finds himself at home, with a noonday sun to guide his footsteps. His feeling of weakness gives place to a feeling of power. Instead of feeling himself overborne and beaten back by a superior force, he is victor, and his enemies are flying, or rather annihilated, before him. This delightful experience, this stepping from darkness into light, this transition from mental chaos and anarchy into a region of order and law, is an exceedingly powerful stimulus.

But if you are to make the most of the interest excited in this or any other way in recitation, you must follow it up. You have asked your pupil a question, and set him to thinking. His thoughts naturally take the shape of a series of questions, and he is eager to get answers to them. What does he need to deepen his interest? Books. Or by a few well-chosen statements you have set his mind in order. He knew a lot of facts, but he saw no connection between them. His mind was like a house into which a lot of new furniture had just been tumbled—everything was everywhere, and nothing was anywhere. Your statements brought order out of chaos. You enabled him to see that the various measures of Washington's first administration were a part of the carefully devised plan

for strengthening the general government that emanated from the brain of the great Secretary of the Treasury. He at once becomes interested in Hamilton. What does he need to deepen this interest? Books. Or your class is studying Hawthorne's "The Great Stone Face." And when they have become thoroughly interested in the strange and beautiful allegory, you tell them of the man who wrote it; of the quaint old town in which he lived and died; of Emerson and Thoreau, and the other famous men who lived there; you try to interest them in some of the great writers of American literature. But if your efforts are to result in any permanent deepening of their interest, they must have access to books.

Without further illustration, it is plain that if you are to make the most of the interest you have excited in recitation, you must be able to direct them to a library. Indeed, to develop interest in your pupils, and expect it to be self-sustaining from the start, is as absurd as it would be for a farmer to take the utmost pains in preparing the ground, and then in planting corn, only to neglect it as soon as he saw the tiny blades peeping through the ground, with the idea that his work was then done. If the tiny blade is to grow into a stalk big enough to bear the golden grain, it must

be carefully cultivated. In like manner, if the interest which teachers excite is to be anything more than a passing emotion, it must be fostered and cultivated; it must be fed by books.

"But libraries are expensive, and school committees and directors often refuse to buy them. What can *we* do in such a case, granting all that you say about their usefulness?" *You can so impress the idea of their importance upon the community as to see that they are got.* It is always to be borne in mind that a library is only a collection of books; and as any finite quantity, however small, is infinitely greater than zero, so any library, however small, is infinitely better than none. This, then, is one of the things which we can do to deepen the interests of our pupils, and so increase their power of attention. We can set them to reading books that will foster and nourish the interests that have germinated in our recitation rooms.

"We can help our pupils in the same direction by a proper system of discipline. Carpenter well says: "The influence of a *system* of discipline by which each individual feels himself borne along as if by a Fate, still more that of an instructor possessing a strong will, guided by sound judgment (especially when united with qualities that attract the affection as well

as command the respect of the pupil), greatly aid him in learning to use that power. As Archbishop Manning has truly said: 'During the earlier period of our lives the potentiality of our intellectual and moral nature is elicited by the will of others.'" The hours of study should be short, especially in the case of younger children. But during those hours they should be put at work adapted to their state of development, and kept assiduously at it. No whispering should be allowed. The boy who whispers to another calls off his attention from his work—obstructs the formation of the very habit you are trying to develop, the habit of concentration. No disorder of any kind should be tolerated. With the utmost kindness, and at the same time with the utmost firmness, your pupils should be made to feel that the hours for study are for *study*. As soon as they can understand them, you should show them the reason for your requirements. You should make them feel that, in obeying you, they are obeying reason, and not arbitrary will. And when they can appreciate the truth of that noteworthy saying of Locke's, "The foundation of all virtue and worth consists in the ability to cross one's inclinations and follow the dictates of reason," you have in their own desire to reach a high ideal a powerful auxiliary.

We can help our pupils in developing powers of concentration by judiciously arranging our programs. You can use your hands and arms until they ache, at the same time that you can walk without any sense of fatigue. In like manner you can use one set of faculties until they are tired, while another set remains comparatively fresh. It is true, of course, that, as the whole body shares to some extent in the fatigue of any of its members, so the mind that has become fatigued for certain kinds of work is to some extent fatigued for all kinds. Still, as we know, change in work, both bodily and mental, is resting. We need to bear this in mind in arranging our programs. Drawing and writing are both a training of the hands and eyes. Hence neither should follow the other. History and geography both tax the memory severely. Neither of them should succeed the other. Arithmetic chiefly exercises the reasoning powers. It should be studied when the mind is freshest.

Finally, we should never permit ourselves to resort to "laziness" or "stupidity" to account for inattention as long as any other explanation is possible. I have already quoted that profound observation of Pestalozzi's, "If our pupils are inattentive, we should first look to ourselves for the reason." Any teacher who

earnestly tries to follow Pestalozzi's injunction will be surprised to find in how large a number of cases inattention and lack of interest on the part of his pupils are due to causes which he can remove. Sometimes a boy is inattentive because he does not see the practical value of the work he is set to doing; sometimes because he doesn't understand certain fundamental ideas which, being in darkness, necessarily darken the entire subject; sometimes because he is overworked and tired; sometimes also—sad to relate—because the teacher, by sarcastic and satirical remarks, has excited the boy's dislike. Grown people are sometimes guilty of "cutting off their noses to spite their faces," and boys very often. And when a teacher indulges in sarcasm at the expense of his pupils, they are very likely to slight their work as much as they can, even when they know they are injuring themselves, *because he wants them to do it*.*

*"Many a boy will sit and seem stolid, and all the while resent your satire with exasperation. You can not tell a sensitive boy by the look. He is not the shy, dark-eyed creature of the school tales. He may just as likely be a ruddy, high-spirited person, or a brawny athlete, or an ugly, lumpy log of a boy. And the satire may often be unjust. And, just or unjust, nineteen boys out of twenty hate it. The worst mistake of all is to use it among small boys. . . . When

Sometimes also boys are inattentive because the facts of the subject have not much natural interest for them, and have never been connected with anything else. One of my pupils told me of a boy, whom he once taught, who had a great dislike of arithmetic. He began to inquire about the boy, and learned that he was very fond of animals and hunting. The next day after learning this fact he gave the class in arithmetic problems about animals. The boy became interested. The teacher pursued this course for a week, and in that time he had acquired such an interest in solving problems about animals that he had come to like arithmetic for its own sake.

Sometimes also boys are inattentive because we do not respect their individuality—because we set them to doing entirely uncongenial work. It is very instructive to learn that Darwin was counted a very dull boy, and I think it quite likely that the same opinion was held of Edison. The trouble, of course, was not with Darwin, but with his teachers. He had a strong bent towards the study of nature, and they wanted to teach him Latin and Greek, and make him memorize

they are ignorant, or inattentive, or stupid, he begins to be sarcastic—*i. e.*, to show a far worse ignorance and stupidity than theirs."—*The Practice of Education*, page 41.

books about nature. If his teachers had practiced Pestalozzi's injunction, this dull boy might have been transformed into the most interesting and interested student in their schools.*

QUESTIONS ON THE TEXT.

1. Under what circumstances is it proper to ask your pupils questions that you do not answer?
2. Mention various ways in which you can use a library to deepen the interest of your pupils.
3. In what ways does a system of discipline aid you in developing your pupils' powers of attention?
4. By what principle should the arrangement of a program of studies be determined?
5. Mention various causes of inattention and lack of interest, and state what can be done to remove them.
6. What do I mean by "respecting the individuality" of the pupil?

SUGGESTIVE QUESTIONS.

1. State the various uses of questioning pupils.
2. If a boy liked arithmetic, and disliked geography, or conversely, how would you try to develop an interest in the subject to which he was indifferent?
3. Do you think there should be elective studies in high schools, and, if so, to what extent?
4. Can you respect the individuality of students who are studying the same subjects?

*See Appendix A.

LESSON XIII.

KNOWING, FEELING, AND WILLING.

IN studying our experience in order to ascertain the nature and laws of attention, we have already observed three fundamentally different classes of mental facts. We have seen that what we perceive, remember, recollect, and believe—as the result of reasoning—depends on what we attend to. But all these acts of mind—perception, memory, recollection, and reasoning—are alike forms of knowledge. Perception gives us what seems to be immediate or direct knowledge of external objects—trees, houses, fences, and the like; memory, direct knowledge of past objects and events; reasoning, mediate or indirect knowledge of objects and events and laws—past, present, and future. They differ, then, in the kinds of facts of which they tell us, and the way in which they tell us about them. Perception tells us of the *present* directly; memory, of the *past* indirectly; reasoning, of past, present, and future *indirectly*. But they agree in being forms or kinds of knowledge. What we perceive, and what we remember, and what we learn by reasoning, we alike know, provided there has been no mistake in the processes.

But we have seen that what we perceive, remember, etc., depends on what interests us—on what gives us pleasure and pain. This interest—this pleasure and pain—is a fundamentally different fact from knowledge. Acts of knowing are indeed usually *accompanied* by pleasure or pain; but the knowing is one thing—the pleasure or pain quite another. We shall see this clearly if we consider the effect the knowledge of the same fact produces on different minds, or the same mind under different circumstances. One man reads an account of a death; it produces no effect, because the dead man was an entire stranger. Another reads it and is prostrated with grief; the dead man was his son. Or you drop your purse, and you see it lying on the ground, as you stoop to pick it up, with no feeling either of pleasure or pain. But if you see it after you have lost it and have hunted for it a long time in vain, you have a pronounced feeling of pleasure.

All forms of pleasure and pain are called feelings. Between the pleasure which comes from eating a peach and that which results from solving a difficult problem, or learning good news of a friend, or thinking of the progress of civilization—between the pain that results from a cut in the hand and that which results from the failure of a long cherished plan or the

death of a friend—there is a long distance. But the one group are all pleasures; the other, all pains. And whatever the source of the pleasure or pain, it is alike feeling.

We saw, also, in studying attention, that it often requires hard work to take our minds from some subject that strongly attracts it. That effort is an example of *willing*. We can easily distinguish *willing* from both *knowing* and *feeling*. The boy who is invited to go skating when he has a lesson to get has a perfectly definite idea—knowledge—of what he is invited to do. That idea gives him a longing to go—feeling—but he does not decide—will—to do it. He wishes to get his lesson; the thought of leaving it unlearned gives him a form of pain. And so, between the anticipations of the pleasure the skating would give him and the pain he feels at thinking of leaving his lesson unlearned, he is undecided for some minutes—he wills neither to go nor not to go. Presently he decides—wills. He says, “I will go,” and immediately makes preparations to start; or, “I will not go,” and resolutely attempts to put all thought of skating out of his mind.

And no matter what you do—whether you walk, sing, talk, jump, think of this or that—the act of the

mind which *initiates* your activity, provided there is such an act—which is not always the case—is an act of the will.

These three classes of facts are all experiences of the same mind or self. You say, "*I know, I feel, I will,*" and you say rightly. The self that knows is the self that feels and wills. Still it is convenient to have names that denote particular groups of these activities of the mind. As it saves circumlocution to have one name to denote the business of a man—farmer—and another his party ties—republican—although the same man is both farmer and republican, so we speak of the mind as *intellect* when we think of it as possessing and exercising the power to know; *sensibility*, when we think of it as possessing and exercising the power to feel; *will*, when we think of it as possessing and exercising the power to will. But it is the one indivisible mind that is intellect, sensibility, and will.

We shall find upon observation that the mind does nothing but know, feel, and will. Probably you don't like to call that act of the mind by which it reaches a false conclusion an act of knowledge, and it is not as the word is popularly used. But, *as a mental fact*, what is the difference between the act of the mind by which it reaches a true conclusion and that by which

it reaches one that is false? None whatever, in many cases. A child sees an old man with white whiskers, and is told that they were black when he was young. Her papa has black whiskers, and so she asks, "Papa, were your whiskers white when you were young?" Her conclusion is false, and yet her mental process is exactly like many that lead her to conclusions that are true. So also memory often misleads, and we often think we perceive what does not exist. But as mental *facts* there is no difference between memory that deceives and memory that tells the truth—between acts of perception that correspond with external objects and those that do not.

Although intellect, sensibility, and will are but different names of the one mind, as feeling and willing and knowing, there is scarcely a moment in our waking hours when we are not doing all three at the same time. Examine our minds when we will, and we shall always find ourselves knowing, and generally feeling and willing.

Nevertheless we can not know intensely and feel or will intensely at the same time; or feel intensely, and know or will intensely at the same time; or will intensely, and know or feel intensely at the same time.

Some of the illustrations of the effects of attention will serve to illustrate this law of the mind also. When Carpenter was engaged in lecturing, he forgot his pain. Why? Because pain is a feeling; and when he was lecturing he was exercising his powers to know very vigorously. A mad man is an insane man—one whose knowing powers are disarranged. Why is it that we sometimes call an angry man mad? Because anger is a state of intense feeling, and a man in such a state often does as foolish things as though he were insane. The expression "wild with grief" has a similar significance—illustrates the same law. You have noticed also that you do not make much progress in those studies which interest you so little as to make it necessary for you to put forth a great deal of effort to keep your mind on them. Why? Because you have to will so energetically to concentrate your attention that there is little energy left for knowing.

The practical rules which are based upon this law are so evident that it is needless to enlarge upon them. You know that when your pupils are amused they do not study much, because amusement—a pleasurable feeling—is a hindrance to that concentration of mind which we call study—knowing.

The law that I have been illustrating is called the

opposition or *antagonism* of knowing, feeling, and willing.

Notwithstanding this opposition, there is an interdependence of knowing, feeling, and willing. When you hurt your hand—feeling—you know that you hurt it—and you try to relieve the pain—willing. Sometimes you have what you call the “blues”—you feel depressed without knowing why. Apart from that case, and bodily pleasures and pains, all feeling depends upon knowing. What angers you or grieves you? Something you know. When your so-called friends backbite you, it does not affect you until you know it; the misfortune that overtakes your absent friends does not trouble you until the news has reached you. The dependence of knowing on feeling I have illustrated at length in the lesson on attention. I tried to show how necessary interest is to attention—and that is only another way of stating the dependence of knowing, so far as it results from involuntary attention, upon feeling. The facts of voluntary attention again illustrate the dependence of the will on feeling. I will to do this or that because of some pleasure or benefit—and that, when analyzed, will be found to consist of some form of pleasure—which I hope to gain, or of some pain which I hope to avoid.

This fact of the interdependence of knowing, feeling, and willing is, as we know, of cardinal importance to the teacher. Teachers are coming to feel the importance of knowing the contents of their pupils' minds, in order that they may adapt their teaching to them. To go from the known to the unknown is to make what the pupil knows a starting-point from which to lead him to something he does not know. Plainly any attempt to explain the unknown will be a failure unless the explanation is made in terms known to the pupil. For this reason intelligent teachers are always trying to make a map of their pupils' minds, that they may learn what points they can help their pupils to start from in making excursions into the unknown.

But there is another fact just as important which we are more likely to overlook. When you have arranged an excursion, there is something else you must do before you can be sure it will be a success—you must see to it that people have a sufficient motive to go on it. So also, when you have planned a mental excursion for your pupils, when you have found a place from which they can start, before you can be sure of their company, you must be sure that they have a sufficient motive for going with you. Dropping

the figure, it is not enough for you to explain things so that your pupils *can* understand you; you must see to it that they have a motive to make the necessary exertion. What wind is to a sailing vessel, and water to a water mill, and steam to a steam engine, that motives—feelings of some sort—are to all intellectual activity. It is not enough to build railroads and cars and steam engines—coal must be mined and water must be converted into steam, or the cars will never leave the depot.

The clear perception of this truth, and of the enormous difference in the educational value of the motives which you may make use of, will give you a new test for determining the excellence of a school. You go into a school—the order is excellent, the lessons well prepared. You say, "That's a good school." But can you be sure of that without further examination? You know indeed that good results are reached; but before you can decide as to the character of the school, you must know what means are employed to reach them—you must know what motives the teacher appeals to. Are the pupils quiet simply through fear? Then all we can say is that the school has one element of a good school—order—but that the wrong motives are relied on to get it. Do they learn their lessons to

avoid punishment? Then again I say the wrong motives are appealed to. Good teaching appeals to motives that will tend to make pupils studious through life. How long will the fear of punishment influence pupils? As long as there is a teacher to inflict punishment. Indeed, as we have seen, it is not enough to make instruction interesting. Volkman well says that the precept of modern Pedagogy is, "Instruct in such a way that an interest may awake and remain active for life."

The question as to the extent to which emulation should be appealed to is undoubtedly difficult, but it is safe to say that it is not to be condemned altogether, as some theorists and idealists would have it. Where it is used to stimulate the idle as well as the industrious, the weak as well as the strong, it is an altogether proper and valuable motive to appeal to. In that suggestive and stimulating book, "Educational Reformers," the author, Mr. Quick, gives an interesting and instructive illustration of some excellent work which the principle of emulation may be made to do. "Let me tell you," he says in an imaginary conversation with a friend, "of one form of stimulus which seemed to work well and was free from most of the objections you are thinking of. When I had a small school of my own, in which there were only young

boys, I put up in the school-room a list of the boys' names, in alphabetical order, with blank spaces after the names. I looked over the boys' written work very carefully, and whenever I came across any written exercise evidently done with great painstaking, and, for that boy, with more than ordinary success, I marked it with a G, and I put the G in one of the spaces after that boy's name in the list hung up in the school-room. When the school collectively had a fixed number of G's, we had an extra half holiday. The announcement of a G was therefore always hailed with delight."—Page 530, Rev. Ed.

This method tended to make the boy emulate his past self, and that was its chief excellence. It was not the merit of a boy's work, in comparison with the work of other boys, that won a G, but the merit in comparison with his own past performances. But I do not mean to imply that it is never proper to try to get our pupils to work by inducing them to try to excel each other. Far from it. A boy who feels that he is a blockhead thinks that it is not worth while for him to try to do anything. Each pupil should be made to feel that there is some thing in which he can excel, and we should regard it as one of our most important duties to try to help him to find what that thing is. We should therefore always be on the alert to detect

any signs of excellence in the work of the dull boys and girls, and be quick to commend it. I have already spoken of a boy who could not spell one word in four in a spelling lesson after hours of study. But he was excellent in arithmetic, and it was altogether proper for his teacher to praise his work in that subject as highly as it would bear.

QUESTIONS ON THE TEXT.

1. What is the difference between mediate and immediate knowledge?
2. Define Intellect, Sensibility, and Will.
3. Define and give examples of knowing, feeling, and willing.
4. Why are erroneous reasonings classed as knowing?
5. What is meant by the opposition of knowing, feeling, and willing?
6. What is meant by their interdependence?
7. Illustrate both from your own observation and experience.
8. What is the test of a good school?
9. What is one of the most important duties of a teacher?

SUGGESTIVE QUESTIONS.

1. Show in detail the relation between the conclusions reached as to the conditions of attention and those reached in this chapter.
2. Can you bring the law of the antagonism between knowing, feeling, and willing under a wider law?
3. Mention ways in which the principle of emulation may be used to get altogether useful results.
4. Give examples of erroneous reasonings in children, and show their resemblance to correct reasonings.

LESSON XIV.

SENSATION.

IN the last lesson we picked out the threads of which the tangled web of our conscious life is composed. We learned that, no matter what subject stands in the center of the field of consciousness—whether the toys of the child, the games of the boy, the ambitions of the young man, the absorbing occupations of maturity, or the retrospective reveries of old age—our entire mental life consists of knowing, feeling, and willing.

If my object were to discuss, even in a superficial way, these various phases of our mental life, it would be proper now to try to ascertain the strands of which these threads are composed, and show how they were twisted into their present form in our experience—to break up the complex forms of knowing, feeling, and willing, of which we are conscious, into their elements, and then trace their growth from their feeble beginnings up to the forms in which we find them.

But I have no such purpose. I intend from this point to confine myself to the intellectual or knowing

side of the mental life, and to those phases of it that have most interest for us as teachers. But even here lack of space prevents me from pursuing a strictly logical course—from trying to break up the complex forms of knowing of which we are conscious, in order to ascertain their elements.

Fortunately, however, we can be sure of some of those elements, at any rate, without any elaborate analysis. It is easy to see that we should never know anything of the objects about us were it not for their action upon the senses. We see that persons born blind have no ideas of colors—that those born deaf have no ideas of sounds; and it is evident that, if a being were born without any of the senses, he would remain in absolute ignorance of the external world, even supposing it were possible for him to have any mental life at all.

We can be sure, then, that sensations are a part, at any rate, of the elements of which our intellectual life is composed. Evidently, therefore, in discussing the intellect, the subject to begin with is sensation.

But what is a sensation? If you ever watched a hunter, at a little distance from you, in the act of firing at a bird, you doubtless noticed that you saw the smoke before you heard the report of his gun. The

reason of that is, you say, that, as sound does not travel as fast as light, you saw the smoke before you heard the report, because the sound was outstripped in the race. But what do you mean when you say that sound travels? Surely not that the sensation traveled, because there was no sensation there. All that were there were vibrations of air. The only immediate result of the firing of the gun was a rapid change in the position of the particles of air—not sound at all, but something which we could see, if air were visible, and if the eye were quick and keen enough to follow its rapid changes. These vibrations of air do indeed travel in such cases; and as we in imagination follow them as they radiate from the hunter as a center, we can realize that what we are following is not sensation, but motion. Presently they reach the end of the auditory nerve. Still there is only motion. The vibrating particles of air cause a change in the particles in the end of the auditory nerve, and these in the particles next to them, and so on, until the brain center is reached. Still we have nothing but motion. But the change in the brain center is followed by something that is not motion—by that unique mental fact which we call a sensation of sound.

You remember that a mental fact is one known or

knowable to but one person directly, while a physical fact may be known by any number of persons—certain conditions being complied with. Evidently all the antecedents of the sensation of sound which we have considered are physical facts. The firing of a gun is a physical fact, since any number of people can see it at the same time. Although we can not say as much of the vibrating air, the reason is *not because of the nature of the fact, but because of defects in our senses*. If our senses were more acute, a large number of people might feel the vibrations of the air that result from the firing of a gun, and hence it is a physical fact. So also of the next antecedent—the changes in the auditory nerve produced by the vibrations of the air. Of course no one has ever seen them, because, in the first place, the nerve itself can not be seen; and in the second place, if it could, its particles are so exceedingly small that no changes in them could be seen. But here again the reason is *not because of the nature of the fact, but of the conditions under which it exists, and of defects in our senses*. Plainly the same is true of the changes in the brain, which, like those in the auditory nerve, are physical facts. But directly after these changes in the brain—perhaps, indeed, contemporaneous with them—a fact occurs utterly unlike the

series of facts that preceded it—a fact which, because of its very nature, is knowable only to the person experiencing it—and that fact is the sensation.

Suppose that the stars had been blotted out of existence, and that they began to exist again while you were looking up at the sky on a dark night, would they immediately give you a sensation of sight? Certainly not. The waves of light would travel for years before they reach your eyes, and even then there would be no sensation. The changes in the retina of your eye would have to be communicated to the optic nerve, and then to the brain center, before there could be a sensation.

These examples enable us to distinguish the several antecedents that precede sensation:*

1. An exciting cause—something to produce a change in the ends of the nerves.
2. The action of this cause upon the nerves. Vibrating air that does not reach the auditory nerve does not tend to produce a sensation of sound.
3. That change which takes place in the nerves in consequence of the effect produced by the exciting cause upon the particles of the nerve with which it comes in contact. What the nature of that change is

*See Lindner's "Psychology," page 32.

no one knows, except that it is some kind of motion. You have often seen boys stand a lot of bricks in a row, so that when one was pushed down it fell against the next, and it against the one next it, until all were thrown down. Spencer compares the effect produced by a falling brick upon the rest of the row in the above case to the effect produced by the change in the particles of the end of the nerve upon the rest of them—not, of course, with the idea that there is any real resemblance in the two cases, but in order to help us imagine how a change in one part of the nerve might be communicated to the whole of it.

4. The change in the brain center in consequence of this change in the nerve. Inasmuch as it is this change that immediately precedes and *occasions* or *conditions* the sensation, we would naturally suppose that, if there were any way of producing it *without* stimulating the nerve that leads to it, the same sensation would exist that ordinarily results from stimulating the nerve. The usual method of ringing a bell is by pulling the bell-rope.* But as the sole utility of pulling the rope is to make the bell swing, so that its tongue may strike against its sides, and as the bell will ring just as well when from any other cause its

*This illustration was suggested by one used by Taine.

tongue is put in motion, so we would suppose that, inasmuch as the sole function of the nerves leading to the brain in causing sensation is to cause a change in the brain centers, if in any way that change is produced without the agency of the nerve, the sensations would exist all the same. There are many facts that indicate that this supposition is true.

It is well known that many chess-players can play with great skill with their eyes closed and their faces turned towards the wall. A man who possessed this power in a high degree gave the following account of it: "When I am in my corner, facing the wall, I see simultaneously the chess-board and all the pieces as they were in reality after the last move; and as each piece is moved I see the whole chess-board, with the new change effected. . . . It is far easier to deceive me when I watch the board than otherwise; in fact, when I am in my corner, I defy any one to mislead me as to the position of a piece without my afterwards detecting it. . . . I see the piece, the square, and the color, exactly as the workman made them—that is, I see the chess-board standing before my adversary; or, at all events, I have an exact representation of it, and not that of another board."—*Taine, "Intelligence,"* page 38.

The same author narrates many other facts that point in the same direction—among others the following: "An English painter, whose rapidity of execution was marvelous, explained his mode of work in this way: 'When a sitter came, I looked at him attentively for half an hour, sketching from time to time on the canvas. I wanted no more. I put away my canvas and took another sitter. When I wished to resume my first portrait, *I took the man and sat him in the chair*, where I saw him as distinctly as if he had been before me in his own proper person—I may almost say more vividly. I looked from time to time at the imaginary figure, then worked with my pencil, then referred to the countenance, and so on, just as I should have done had the sitter been there. *When I looked at the chair I saw the man*. Gradually I began to lose the distinction between the imaginary figure and the real person, and sometimes disputed with sitters that they had been with me the day before. At last I was sure of it, and then—all is confusion. . . . I lost my senses, and was thirty years in an asylum.'"*

These are a few of many cases that might be cited to show that sensations often exist when the nerve that leads to the brain is not stimulated. If we

* Ibid, p. 46.

should hear a bell ring when the rope was not pulled, we should be sure that the same effect (swinging of the bell) existed as when the rope was pulled. So, likewise, when sensations exist in the manner described above, one can scarcely help believing that the bell was swinging without the rope being pulled—that there was the change in the nerve center that occasions and conditions sensation without the stimulation of the nerve that usually causes it.

These four physical antecedents, then—the exciting cause, its action upon the nerve, change in the nerve, changes in the brain—usually precede the mental fact that we call sensation.

If now you were asked to give examples of sensation, would you mention the hearing of a drum and the seeing of a rose? I do not believe you would. Let us run over the series of facts that result from the beating of a drum—vibrating air, action upon the auditory nerve, change all along the auditory nerve, change in the brain—and see if we can not distinguish between the next term, the sensation, and the hearing of the drum. If you beat a drum in the presence of a new-born babe, will he hear it? No; *he will have a sensation of sound, but he will not hear the drum.* We may have sensations of sound, and not

hear anything; sensations of color, and not see anything; sensations of smell, and not smell anything; sensations of touch, and not touch anything; sensations of taste, and not taste anything.

What do you mean when you say you see an apple? You mean, among other things, that you see a round object, good to eat, and with a pleasant odor when brought near the nose. Do you *see* its odor? No; you learn the odor of things through the sense of smell. Do you *see* its taste? Again, no; you learn the taste of things through the sense of taste. Do you *see* its roundness? No; you learn the shape of things by the sense of touch and the muscular sense. How, then, are you able to know by sight alone that an object before you has a certain shape and taste and odor?

To answer that question, suppose you ask yourself what a man would know of an apple who saw one for the first time, and who had never heard of one before. He would know its shape, but he would know nothing of its odor and taste. If he tastes and smells the apple, the next time he sees an object resembling it closely in looks, it will be likely to occur to him that it resembles it in taste and smell
r words, that it is an apple.

There is, you observe, a great difference between the experience of color which you have when you are looking at an apple and the ideas of odor and taste that it suggests. *The experience of color is a present sensation; the ideas of odor and taste which it suggests are recollections of past sensations of taste and smell.*

We are now ready for the definition of sensation. A sensation is that *simple* mental fact that, under normal circumstances, *directly* follows the last change in the brain in consequence of the stimulation of a sensory nerve.

Note carefully the italicized words. I say "*directly* follows." If we bear that in mind, we shall not confuse the sensation with what it suggests. The color of an apple suggests its taste and odor; but until you actually taste and smell it, its taste and smell are not sensations, because they do not directly follow the last change in the brain resulting from the stimulation of a sensory nerve. The only thing that directly follows the last change in the brain is the sensation of color; the thought of the taste and smell of the apple are the result of the sensation, so that this change in the brain makes you think of its smell and taste *through* the sensation, or *indirectly*.

If we bear in mind the significance of the word

"simple," it will save us from the same mistake. When you are seeing, hearing, touching, and tasting things, your experience is not simple. You have a sensation, and with it the recollection of sensations that it suggests.

We can now see how we can have a sensation of sight without seeing anything. If you are walking along a road, the various objects within the range of your vision probably produce sensations of sight. Will you see the objects in case they do? That depends on whether they suggest the recollection of past sensations. But, as we know, what we recollect depends on what we attend to. When, therefore, you are absorbed in thought, the chances are that you will see very few of the objects that give you sensations of sight.

QUESTIONS ON THE TEXT.

1. Summarize the results reached in the last lesson.
2. What would be the logical course if one intended to write a comprehensive treatise on the subject of Psychology, and why?
3. Show that a large part of our knowledge takes its rise in sensations.
4. Give examples of sensations from each of the five senses, discriminating carefully their physical antecedents and the sensation.

5. Which of these physical antecedents may be dispensed with without preventing the sensation from existing, and why?
6. Define sensation. Distinguish it from what it suggests.
7. How can we have sensations of sight without seeing anything?

SUGGESTIVE QUESTIONS.

1. How would you explain the sensations experienced in dreaming?
2. If an explosion were to take place on a desert, in the absence of any mind, would there be any sound?
3. Is there any ambiguity in the words "sound," "color," "taste," "smell," etc.?
4. What is the real difference between physical and mental facts?

LESSON XV.

SENSATION.

LET us imagine ourselves taking a walk on one of those perfect days in June. The fresh, delicate green of the trees, the songs of birds, and the odors of a thousand flowers and blossoms, delight us. But in the midst of our enjoyment the subject of the last lesson occurs to us. We cease to enjoy; we begin to think. We ask each other if the conclusions reached in the last lesson, which seemed so true as we worked them out by gaslight, really do hold of the gorgeous panorama that lies spread out before us. Is the delicate green of the trees, the deep blue of the skies, merely a web of our own mental facts, a garment of our own making, with which, unconsciously to ourselves, we have covered up the unsightliness of nature? Are the so-called songs of birds merely echoes in our own souls of soundless motions without? In one word, are the colors and sounds and odors that seem to fill the scene before us *only* mental facts—things that, like the joys and sorrows, the hopes and fears, that make up our conscious life, *exist in our own minds, and nowhere else?*

Whatever reason may say, our first impulse is to answer with an emphatic negative. But as we follow, in imagination the vibrations of air radiating from the birds in every direction, and the waves of light from the leaves of the trees, we are forced to conclude that leaves, songs of birds, blossoms and flowers are only exciting causes of effects which appear in our conscious life as sensations.

But the thought is unwelcome. We had supposed ourselves looking at green trees and velvety hills and a blue sky; our reasoning, like the wand of an envious magician, seems to strip the world of its beauty, and leave us in the presence of—we know not what. We struggle to get away from it. We feel as though an old friend, the recollection of whose voice mingles with the earliest memories of our childhood, had suddenly begun to speak to us in an unknown tongue—or rather that the tones and language with which we had thought ourselves entirely familiar, and which had seemed to signify the most precious things in life, had suddenly shivered into meaningless noises—had become “sound and fury, signifying nothing.”

In our desire to keep the world we have known, we first betake ourselves to words. We bethink ourselves of our studies in physics, and say that, although sounds

and colors are sensations, yet there are sounds and colors in nature. Undoubtedly, but of what kind? *The sounds in nature are vibrations of air; the colors, undulations of ether.* Are these what we think of when we speak of sounds and colors? If so, the terms with which we describe sounds and colors will apply to motions; when we are speaking of sounds and colors, we are speaking of motions. Is it true, then, that when we speak of sweet, melodious sounds, we mean sweet, melodious *motions*? Or when we speak of rich, gorgeous colors, do we mean rich, gorgeous motions? A moment's thought convinces us that the things we have in mind when we use these terms are not motions at all; the colors and sounds that we think of in ordinary life—that thrust themselves upon our notice every moment—are not undulations of ether and vibrations of air—are not things that the world learned about only after centuries of investigation, but the colors and sounds of experience—sensations.

Failing in this attempt, we try again. We say that, although the colors and sounds that we talk about are sensations, yet they are *copies* of facts that exist in the real world. The colors and sounds and odors of which we have direct knowledge are sensations; but we know how an object looks without looking at it

if we see its reflection in a mirror, so the sensations of consciousness give us exact knowledge of the world beyond consciousness; they are the reflections of objects in the external world. The green that seems to be spread over the leaves is indeed spread over it, but the green that we have direct knowledge of is in our own minds. The green in our minds is the sensation, the green of experience, the copy; the green of the leaves is the outside reality—the original.

But we are at once confronted with a difficulty. I see your picture hanging on the wall. I immediately recognize it, because picture and original are both before me. But you point to another—a picture of a gentleman whom I have never seen—and ask me if I think it good. Of course I can not say, since I have never seen the original. Before I can say whether a picture is like the original, I must have seen both. *As long as I look at a picture of which I have never seen the original, I can not say either that it is like the original, or that it has any original at all.* How, then, can we say that our sensations are like the external things which cause them?

Before we began the investigations of the last lesson, we thought that the odors and sounds and colors of which we have direct knowledge were physical

facts, external to the mind. But we learned in the last lesson that these supposed physical facts are not physical facts at all. In order to stand by our conclusion, and at the same time keep our belief in the character of the external world, we have supposed that there are parallel series of facts—mental facts of which we are conscious, and physical facts of which we are not conscious; the one a copy, the other the original. But it is now evident that we have no right to say that our sensations are copies of these external facts. We are conscious of the one set of facts; we are not conscious of the other. Until we become conscious of both—that is, until both become sensations—to say that one is a copy of the other is to say that something we know is a copy of something we do not know.

But that is not the only difficulty. You have great skill in painting. Suppose I should ask you to make me a picture of Yankee Doodle. You would tell me that my request is absurd, would you not? You would say that sounds can resemble sounds, and colors colors, and tastes tastes, but that there is such utter unlikeness between sounds and colors that we can not use language intelligently and say that any sound is like any color. Is not the same true of mental and

physical facts? In what sense can we say that a mental fact is a copy of a physical fact—a state of consciousness a copy of something that is not a state of consciousness? In no sense whatever. We must say either that the world of sounds and tastes and odors and colors is purely subjective, in the sense of consisting of our own mental facts, or else that the conclusions reached in the last lesson are wrong.

But, apart from these considerations, there are many facts that make any other conclusion impossible. That conclusion is that what we call the attributes or qualities of objects—tastes, smells, sounds, colors, etc.—are sensations which these objects produce in our minds through the agency of our nervous systems. How does it happen that I can make the world look green or red or blue or yellow by looking at it through green or red or blue or yellow glass? Or that I can change the apparent temperature of water by changing the temperature of the hand I put in it? Or that when I am sick nothing tastes as it does when I am well? Evidently because the qualities of objects are merely ways or modes in which the objects affect us through the agency of the nervous system; and whenever for any reason a different effect is produced upon the nervous system, the object seems to have a dif-

ferent quality because we have different sensations. In the case of the colored glass, the nervous system is affected differently because of a change produced by the glass upon the agent—light—that acts upon the nervous system. In the last case spoken of, the difference in taste is due to a difference in the condition of the nervous system itself, in consequence of the disordered condition of the body. Sometimes the quality we attribute to an object—in other words, the sensations produced by it—depends upon the part of the body affected. If you take a pair of compasses, whose points are somewhat blunted, and place their points on the forearm, in the direction of the length of the arm, the two points will seem as one, unless they are more than $1\frac{1}{6}$ inches apart. But placed on the tip of the tongue, the two points are distinguished as two when they are as much as .0394 of an inch apart.

These facts make it certain that the quality of an object is not something attached to, or inherent in, the object, but merely the mode or way in which the object affects us through the nervous system.

And yet we can not say that everything which produces a change in the nervous system produces a change in the sensation. If you hold a one-pound weight in your hand when your arm is outstretched,

a friend may add one-half or two-thirds of an ounce—if you do not see him—without your knowing it. Not until the added weight is about one-sixteenth the original will you perceive the difference. And you will find by experiment that the same proportion holds if you make the weight in your hand heavier—*i. e.*, if it be ten pounds, it will be necessary to add ten ounces before you can detect the difference.

Such facts make it necessary for us to qualify the conclusion suggested by the facts before considered, and say that, whenever the change produced by objects in the nervous system reaches a certain degree, that change will be followed by a change in the sensations.

But an interesting question here arises—the question as to whether our sensations always wore the character they now bear—the character of seeming to be what they are not—objective qualities of objects, rather than subjective effects of these objects, produced through the nervous system; or whether in the beginning of our conscious life they appeared to be what they are—experiences of our own minds. A very slight observation of a new-born child will be sufficient to convince us that his sensations do not seem to him as ours do to us. Indeed, as we have seen already, it

is probable that in the beginning of our mental life we have no definite sensations. Little by little, a child's sensations become definite; little by little, they are built up into the qualities and attributes of the external world. How is it done? That is a difficult question, the answer to which is the solution of the problem of perception. But before we can attempt to consider it, we must study the great law by means of which, in part, the consciousness of sensations becomes the perception of external objects—the law of the association of ideas.

QUESTIONS ON THE TEXT.

1. Do you find yourself unwilling to believe that colors sounds, etc., are sensations?
2. What are the sounds and colors spoken of by physics?
3. Show that our sensations are not copies of physical facts.
4. Mention other facts that show that what the world appears to us to be depends on changes in the nervous system.
5. Is every change in the nervous system followed by a change in the sensation?
6. Do a child's sensations seem to be qualities of objects?
7. What is the problem of perception?

LESSON XVI.

ASSOCIATION OF IDEAS.

IF you think about anything, no matter what, you are sure to find yourself thinking, the moment after, of something connected with it. Think about the last school you attended, and you may think of a schoolmate, or of some of the books you studied, or of some of the games you played. Think of Napoleon, and you may think of a friend who lent you a book about him, or of some of his battles, or of Alexander or Cæsar. This fact, that thinking of anything tends to make us think of something else connected with it, is called the association of ideas.

If you watch the course of your thoughts for an hour, you will find that there are very different kinds of connection between the ideas recalled and the experiences that recall them. If you think of a hill, it may make you think of a walk you took there last night, or of one like it near your own home. The thought of the hill makes you think of the walk you took there, because when you were taking the walk you thought of the hill. In other words, the thought

of the hill and the thought of the walk *were in your mind at the same time*. The thought of the hill makes you think of one like it near your home, not because you have ever seen or thought of them both at the same time before, but because they are *like each other*.

Association of the first kind—association by contiguity, as it is generally called—is sometimes called mechanical association; and I think it will be useful for us to remember both names, and the reasons for them. It is called association by contiguity because contiguity means nearness, and the things associated by contiguity were thought of at or about the same time. It is called mechanical association to contrast it with another kind of association called logical or rational. When the thought of the hill makes you think of one like it near your own home, it is because there is an *inner* relation—similarity—and not a mere external, mechanical relation between them. But if the first time a child sees a Chinaman and a steam-engine he sees them both together, the next time he sees one of them he will be likely to think of the other, not because they have any inner connection, but because they were seen at the same time. Hence this kind of association is called mechanical, because the things associated have only an external or mechanical

connection; it is called association by contiguity because they were thought of at or about the same time.

Evidently the connecting link in the case of things mechanically associated is time; but we must be careful to remember that the time which forms this connecting link is *not the time in which events happen, but the time in which we think of them*. The Declaration of Independence makes you think of the Fourth of July, not because it was made on that day, but *because the thought of the two has been in your mind at the same time*.

But in order that we may associate things rationally or logically, we must be able to perceive some *inner relation* between them. Things as unrelated as it is possible for things to be in this world may be brought side by side in space; and if so, we may see them at the same time, and so associate them mechanically. But in order to associate them logically we must be able to apprehend an inner relation between them—a relation not depending on accident or chance, but growing out of their very nature.

Of these inner relations, besides likeness, the relations of cause and effect, of instrument and use, of means and end, of premise and conclusion, of law and

example, at once occur to us; and a careful study of them will enable us to realize the contrast between the *innerness* of logical relations and the *outerness* of mechanical relations. Two peaches can not but be like each other—they would not be peaches if they were not; a good school must be a useful agency in developing the minds of its pupils; fire must throw out heat as long as the present constitution of the world remains the same. In all these cases it is evident that the relation is not external or accidental or casual, but *inner*—growing out of the very nature of the things themselves.

But why does a cause make us think of its effect; a means, of the end it is adapted to reach; an instrument, of its use; a premise, of a conclusion? *Partly* because the thought of the two has been in the mind at the same time. But that this is not a complete answer is evident from the fact that, of the various thoughts in our minds at the same time, those are most likely to recall each other that have some inner relation. Of the things we think of during the course of a day, most of them pass away beyond the possibility of recall, because they are meaningless, isolated, disconnected—because the only connection between them is the time in which we think of them. Evi-

dently, therefore, there is something in the fact that thoughts have some logical connection that tends to make them recall each other. Let us see if we can learn what it is.

We know that anything upon which we fix our minds for a considerable length of time—anything that interests us, anything that for any reason we attend to—is more likely to be recalled than the things which merely flit across our minds like shadows across a landscape. But the things that have an inner relation are precisely those we are sure to attend to, provided we apprehend the relation. We are sure to attend to them in the first place, because the apprehension of relations is a source of keen intellectual pleasure. We have seen already how it delights the mind to have a lot of disconnected, straggling facts marshaled into compact array, each one dropping into its proper place in relation to the rest. It increases our sense of power. To carry a load of facts by mechanical association has been aptly compared to the carrying of food "in a bundle strapped upon the back;" the carrying of the same facts by rational association, to the carrying of the same food "eaten, digested, and wrought over into the bones and muscles which hold the body firm and solid." Now, whatever

adds to our sense of power—whatever gives us pleasure—is sure to be attended to; and the greater the feeling of power, and the keener the pleasure it gives us, the greater the amount of attention we give it.

But apart from this the apprehension of inner relations is of the greatest practical interest to us. The ability to go from effects to causes and from causes to effects, from laws to examples and from facts to laws, from premises to conclusions and from particulars to premises, to adapt means to their ends and instruments to their uses, not only marks the great difference between the mind of civilized man and that of a savage, but results in the almost infinitely greater command that the former has over the resources of nature. To have special ability in the apprehension of the inner relations of things is to have power not only as an intellectual possession, but in the sense of ability to accomplish the things that men wish to accomplish in life. And this is another reason why we are sure to attend to things when we perceive their inner relations; whether they have a natural interest for us or not, they have an acquired interest, because we know we can use such knowledge in reaching desired results.

These two causes bring a third one into operation,

Because of these two causes a large part of our intellectual life consists in the search for inner relations. Study, as we first conceived it, consisted in the exercise of mechanical association. But both as students and as men and women of the world we have come to have an entirely different notion of it. We have come to see that study—thought—consists in the attempt to apprehend the inner relations of things and to see that progress—no matter in what direction—depends upon the success of our efforts. In this way we form the habit of noticing the inner relations of things, even when we do not see how the knowledge is likely to be of practical value. For these three reasons, then (1) because of the pleasure the mind derives from the perception of inner relations; (2) because of the practical interest such relations have for us; and (3) because of habit—we are more likely to attend to things between which the mind perceives them than to disconnected facts. The reason, therefore, why we are more likely to recall things associated logically than we are to recall any other facts experienced at the same time is because the former are more closely attended to.

We are left, then, with two great laws of association: The law of association by contiguity that

thoughts or ideas or experiences that have been in the mind at or about the same time tend to recall each other ; and the law of association by similarity that similar thoughts or ideas or experiences tend to recall each other.

Some Psychologists attempt to explain *association by similarity by association by contiguity*. The following quotation from Thomas Brown will explain their position: "A ruff like that worn by Queen Elizabeth brings before us the sovereign herself, though the person who wears the ruff may have no other circumstance of resemblance; . . . it is necessary only that a part of the complexity (the Queen) should be recalled—as the ruff—to bring back all the other parts, by the mere principle of contiguity. . . . In like manner we might be able to reduce every case of suggestion"—association—"from direct resemblance to the influence of mere contiguity."

We might state his illustration this way: $ruff + a b c d$, $a b c d$ meaning a person wearing it recalls $ruff + e f g h$, $e f g h$ meaning Elizabeth—because the thought of Elizabeth and the ruff were in our minds at the same time.

Others explain *association by contiguity by association by similarity*. The same example can be used to

illustrate their position. They would say, granted that $ruff + a\ b\ c\ d$ recalls $ruff + e\ f\ g\ h$ because there is a ruff in both cases, but the ruff that Elizabeth wore is not the one we see now. Let R stand for the ruff we see now and R' for the ruff worn by Elizabeth, and we can symbolize the facts in this form: $R\ a\ b\ c\ d$ recalls $R'\ e\ f\ g\ h$. Stated in this form, they say, it is evident that $R\ a\ b\ c\ d$ recalls $R'\ e\ f\ g\ h$ because of the likeness between R and R' .

I think we shall agree that the latter have only explained why R recalls R' . To account for the fact that we think of $e\ f\ g\ h$ also, I think we must say R' recalls $e\ f\ g\ h$ because they were thought of at the same time.

We have, then, as our fundamental law of association the following: *One thought, idea, or experience tends to recall similar thoughts, ideas, or experiences, and all other thoughts, ideas, or experiences that were in the mind at the same time.* Remembering the influence exerted upon association by the apprehension of inner relations, we see that the above law requires qualification: *One thought, idea, or experience tends to recall similar thoughts, ideas, or experiences, and all other thoughts, ideas, or experiences that were in the mind at the same time, the latter with a force propor-*

tionate to the number and clearness of the inner relations apprehended between them and the attention we bestow upon them.

QUESTIONS ON THE TEXT.

1. Illustrate what is meant by *association of ideas* from your own experience.
2. Illustrate from your own experience the different kinds of association.
3. What is the difference between logical association and association by contiguity?
4. Explain the different names for association by contiguity.
5. Explain the various reasons why things logically associated tend to recall each other.
6. State the two laws of association and explain the attempts to derive one from the other.
7. State verbatim the formula in which the two may be stated.

SUGGESTIVE QUESTIONS.

1. Explain *ideas* in the phrase *association of ideas*.
2. A child seeing a snake licking out its tongue, said it was making faces at him. What kind of association was that?
3. I read to-day the following sentence from Goethe: "Take care of the beautiful, and the useful will take care of itself," and at once thought of Spencer's essay on "What Knowledge is of Most Worth." Why?
4. What kind of associations do children first form?

LESSON XVII.

PERCEPTION.

WE have seen already that all knowledge takes its rise in sensation. The mental history of every human being begins with its first sensation. Before the first sensation, the only difference between a human being and any other growing thing—a tree, for instance—so far as mind is concerned, consists in the fact that the former possesses the potentiality of mind. This potentiality first begins to become actuality when the human being experiences its first sensations.

But although knowledge takes its rise in sensation, it by no means follows that the first experience of sensations constitutes the beginning of knowledge. If we consider what knowledge is, we shall see that, in the nature of the case, the mind must have sensations before it knows it has them. I do not mean merely that a fact must exist in order to be known. That, of course, is true of sensations, but more than that is true. Sensations not only must exist in order to be known, but they may exist—and often do—for a considerable period before they are known; and I

think, if we realize what knowledge is, we shall see that in the nature of the case this must be so.

What is it to know a thing? It is to put it into a class, is it not? A child sees a menagerie, and fixes his eyes on an animal unknown to him. In what does his ignorance of it consist? In his inability to class it. He looks at it steadily, and suddenly shouts, "Oh, it is an elephant!" What has happened? How is it that ignorance has given place to knowledge? He has suddenly noticed the resemblance between this unknown object and certain pictures he has seen in his reading book; he has put it into a class, and when he has classed it he knows it.

This putting things into classes constitutes the essence of *all* knowing. Some kinds of knowledge we call science—orderly, systematic knowledge—knowledge of laws and causes and principles; other kinds we call unscientific, because in these cases our knowledge is unsystematic and disconnected. But whether we know scientifically or unscientifically, in order to know a thing we must classify it, and in the act of classification consists our knowledge of it. Before Newton, no one understood the motions of the moon. He helped us to understand them—explained them, as we say—by helping us to classify them. But in what

does our understanding of them consist? Merely in that we have put them into a class along with many familiar facts. As the child felt that he knew the animal in the menagerie when he noticed its resemblance to the pictures he had seen in his reading book, so we feel that we understand the motions of the heavenly bodies when we have put them into the same class with familiar facts, such as the falling of a leaf or the dropping of a stone. As to the *cause* of these motions—as to the nature of the force upon which they depend—we are as ignorant to-day as were those old Chaldeans who used to stand on the plains of Chaldea gazing up into the sky with that wondering curiosity which has been so well called the mother of knowledge. We call it gravity, and think we know all about it, because when the mind sees the resemblance between a strange fact and familiar facts the sense of mystery is gone. Suppose we should ask what is the cause of death, would you think it a sufficient answer to say that all things die? That is a precise illustration of our explanation of the motions of the heavenly bodies. What makes the heavenly bodies move? The law of gravitation, or the force of gravity, is answered. But that is only another way of saying that all bodies move.

If, then, all knowing is merely classifying—if a thing unknown is merely a thing unclassified—the first sensations must be unknown. A boy can not put his first piece of money in his purse with the rest of his money, because he has no other money. So the first sensation can not be classed with preceding sensations, because, since it is the first, it has no predecessors. Knowledge, then, takes its rise in sensations, not in the sense that the first experience of sensations constitutes the beginning of knowledge, but in the sense that *sensations constitute the first material upon which the mind's powers of knowing are exerted.*

Observations of new-born children will not only confirm this reasoning, but will lead us to suppose that for some little period in the beginning of a child's life there is no knowledge of sensations. Knowledge begins with attention. Not till the child attends to his sensations can he be said to know them in any proper sense of the word. But what shall we say of these sensations before they are known? What characteristics do they have? *None whatever.* Our sensations are *this* rather than *that*—sensations of color rather than sensations of sound—*through being known.* Before they are known—before they are individualized through being attended to and classed—we can call

them sensations of sound, for example, only in the sense that they are occasioned by the stimulation of the auditory nerve. We speak of this sensation and that idea because we have fixed our attention upon the fact so individualized, and have chosen to consider it as a whole. But all the experiences we have at any moment are parts of one indivisible whole, and such distinctness as they have is the result of a gradual process of differencing brought about by attention and classification. Ward well says: "It is impossible for us now to imagine the effects of years of experience removed, or to picture the character of our infantile presentations"—sensations—"before our interests had led us habitually to concentrate attention on some and to ignore others, whose intensity thus diminished as that of the former increased. In place of the many things which we can now see and hear, not merely would there then be a confused presentation of the whole field of vision, and of a mass of indistinguished sounds, but even the difference between sights and sounds themselves would be without its present distinctness. Thus the further we go back, the nearer we approach to a total presentation"—experience—" . . . in which differences are latent."

This, then, is the material first presented to the

mind—an undifferented, unindividualized, confused and definite mass of sensations; this is the material first presented to the mind through the senses. But what do the senses seem to tell us now?

Put an apple on your table and sit far enough away from it to prevent it from affecting any sense but the sense of sight. What do you learn about it through the sense of sight? Merely its color. But what is color? A quality of objects, we should have said a little while ago. But have we not seen that this quality of objects, this color of the apple, is simply a sensation, a state of our minds? A sensation, we have seen, is that simple mental state that directly follows the last change in the brain that results from the stimulation of a sensory nerve. Is any nerve stimulated in this case? Yes; the optic nerve. The waves of light strike the retina of the eye and cause a change in it, and this in the adjacent particles of the optic nerve, and these in the particles next to them, and so on until the brain is reached; and then—what happens then? Why then, as we have seen, there follows a sensation of color.

Close your eyes now, and request a friend to bring the apple near enough to you to enable you to smell it. What does the sense of smell tell you about it?

Simply its odor. But what is odor? Is it not evident that it is simply a sensation? It is unnecessary to repeat the reasonings of the last paragraph. We have again a stimulation of a sensory nerve, a change all along the nerve, a change in the brain, and then—a sensation.

Evidently *all that the senses tell us of objects is the sensations they produce in our minds*. But this is not what they seem to tell us. They seem to tell us of *objects*, and of these (1) as having definite qualities, and (2) occupying a definite position in space. The apple that the sense of sight reveals to me is an object having certain definite qualities—round, red, mellow, etc.—and in a certain place—on the window-sill some ten feet away.

In some way, then, those undifferentenced, unindividualized, indefinite sensations with which our mental life began not only become definite, but are, as it were, projected out of us, and regarded as qualities of external objects. How do they get these three characteristics? (1) How does a sensation that was not first known even as a sensation of color, for example, become known as a definite sensation of color—say a particular shade of red? (2) How does it become localized—projected at a certain distance—say

ten feet away? (3) How does it become regarded as a quality of an external object—as an apple? To answer these three questions is to explain the problem of perception.

QUESTIONS ON THE TEXT.

1. Make a careful summary of the conclusions reached in the two lessons on sensation.
2. In what does knowledge consist?
3. What is the difference between scientific and unscientific knowledge?
4. Show that the first sensations can not be known.
5. What is meant by the assertion—knowledge takes its rise in sensation?
6. What is the character of our first sensations?
7. State and explain the quotation from Ward.
8. What do the senses tell us of objects?
9. What do they seem to tell us?
10. State the three questions which a theory of perception has to answer.

SUGGESTIVE QUESTIONS.

1. If the first sensation is not known, how can the knowledge of sensations originate?
2. Is the assertion, *knowledge begins with sensation*, equivalent to *all our ideas were derived from sensations*? If not, what is the difference?
3. What is the meaning of the terms, *sensationalist*, *empiricist*, *transcendentalist*?

LESSON XVIII.

PERCEPTION.

WE saw in the last lesson that what the senses really tell us of objects is *how they affect us—the sensations produced by them in our minds—but that they seem to tell us of objects themselves as having certain qualities, and occupying a certain place.*

What does the mind do to its sensations of color and smell and taste in order to perceive colors, odors, and tastes as qualities of objects? It groups them together, does it not? When you look at an apple, you group its color, taste, and smell together as qualities of one object. Sully puts it as follows: "Sense-impressions"—he means sensations—"are the alphabet by which we spell out the objects presented to us. In order to grasp or apprehend these objects, these letters must be put together after the manner of words. Thus the apprehension of an apple by the eye involves the putting together of various sensations of sight, touch, and taste. This is the mind's own work, and is known as perception." He compares sensations to the letters of the alphabet; and precisely as in reading we put the letters b, r, i, c, k, together and read "brick," so, in

perceiving, we put together certain sensations and so gain a knowledge of objects.

But this grouping of sensations together is not all we do when we perceive. As long as your sensations *seem* to be sensations, you do not perceive. You perceive only when they seem to be what we have seen they are not—qualities actually forming a part of the objects in the world about us, or states of our own bodies.

To perceive, then, is to group sensations together and regard them as qualities of external objects. But is that entirely accurate? When we perceive an apple by the sense of sight, we group the sensation of color with recollections of past sensations—taste, smell, feeling of mellowness, etc.—do we not? Strictly speaking, then, what we do when we perceive is to make a group consisting of one or more sensations, and ideas of sensations, and regard the group as qualities of an external object.

The state of mind that results from perception is called a percept. We must be careful not to confuse this with image. While you are looking at an apple your state of mind is a percept; when you turn your head away and think about it, the picture that you form of it is an image.

In order to reach a percept, the mind must take three steps: (1) it must be conscious of a definite sensation; (2) it must group this sensation with images of sensations already experienced; and (3) it must think of these sensations as qualities of objects having a more or less definite position in space.

To explain the problem of perception, then, is to explain how the mind comes to take these three steps.

I have no intention of attempting to explain perception. It is universally conceded to be one of the most difficult subjects in Psychology. My purpose will be accomplished if we can get a definite idea of the problem that a theory of perception undertakes to solve, and some general idea of what seems to me the true solution.

Perhaps it will be more convenient to consider the problem of perception in the form in which it was stated in the last lesson, although the two forms are in fact identical, as a little consideration will enable us to see.

(1.) How is it that the mind becomes conscious of definite sensations—that unindividualized sensations come to be individualized, and known as such and such sensations? That question our study of attention enables us to answer. If a child's experience consisted

entirely of sensations of sound, it is easy to see that the loudest—those having the character of greatest intensity—would be sure to be attended to in the course of time. They would stand out in the foreground of his consciousness—would be individualized—and thus lose the indefiniteness that characterizes a child's experiences in the beginnings of its mental life. Evidently, also, the pleasurable or painful character of its experiences would have the same effect, since it is likewise a cause of attention.

(2.) How is it that these sensations become localized—projected into our bodies and into the external world? Very young children evidently do not localize their sensations. When painful operations are performed upon them, their hands do not need to be held, since they do not know where the pain is. How do they finally come to get this knowledge?

Whether your little finger is pinched, or touched, or burnt, or bruised, or cut, you locate the sensation in it—you know that it is your little finger that is affected. How is it that you are able to do this? How is it that when such different sensations as those of a mere touch, a burn, a bruise, a cut, a pinch, report themselves to consciousness, you are able to refer them all to the same place? Precisely as you can tell what

country an Irishman comes from as soon as you hear him talk. There are tall Irishmen and short Irishmen, stout Irishmen and lean Irishmen, Irishmen that are handsome and Irishmen that are homely; but, no matter how widely they differ in appearance, as soon as you hear one talk you know that he hails from the land of Erin. And precisely as the brogue of an Irishman enables you, as soon as you hear him speak, to tell his nationality, so, since we are able to locate in the same place the various sensations that arise in connection with the little finger, those sensations must have *some characteristic in common*. A mere touch, a burn, a bruise, a cut, a pinch, differing as widely as they do, could not be referred to the same place if they did not speak a language that betrayed their origin. The characteristic of our sensations—the brogue which betrays their origin—by means of which we are able to locate them, first in our bodies, and some of them afterwards in the external world, is called *the local sign*.

But perhaps the first time you noticed the brogue of an Irishman you did not know what country he came from. If you had noticed it in a dozen or fifty people, without knowing they were from Ireland, you would not have known that it was a mark of Irish

nationality. Not until you knew that there was such a country as Ireland, and that the men whose brogue you noticed were natives of it, could the brogue of an Irishman mean to you what it means now. Granted, then, that the sensations we receive from the various parts of our bodies have each their own local signs, these local signs are still characteristics of sensations; how can the mind regard characteristics of sensations as signs of what is not sensation? Evidently it is possible only as the mind has in some way an idea of the thing signified. As a brogue could not mean Irish nationality if we did not know there is such a country as Ireland, so local signs could not be signs of locality if we had no idea of space. But the very thing we are trying to explain is how unlocalized, unspatialized sensations become localized. Are we to say that they have local signs, but that, in order that these signs may have any meaning, we must have the idea of space already? Certainly not; for by supposition all that we know is unlocalized sensations. But if we had no idea of space *before* the apprehension of these local signs, and if we must have it in order to use them, as we unquestionably do in localizing our sensations, *the local signs must have been originally apprehended as signs of place.* You can not explain why a certain brain

change is followed by sensation ; all you can say about it is that it is so. Nor can you explain why some of these sensations are sensations of color ; when we say that it is so, we have reached the end of our string. The conclusion to which our reasoning leads us is that just as certain brain changes are followed by those mental facts which we call sensations, so the apprehension of certain characteristics of our sensations is followed by the apprehension of space. We are able to locate our sensations ; we could not do it in the beginning of our mental life ; we could not locate widely different sensations in the same place if they did not have some common characteristic—some local sign ; this local sign could not be to the mind a sign of place unless the idea of place *existed before, or began to exist at the same time with the apprehension of the local sign ; the idea of place did not exist before ; therefore it began to exist at the same time with the apprehension of the local sign.* Why it did we can not tell ; but everything that we believe rests, in the last analysis, on the inexplicable.

Assuming the existence of local signs, and a native power to apprehend them as signs of place, we can see how the mind would gradually form an idea of the place occupied by the body. Certain sensations from

the various parts of it, each having its own local sign, would give an account of the different localities where the nerve originated that occasioned them. With the idea of the place occupied by his body, the child would soon form an idea of the place occupied by bodies around him. By grasping first his wrist and then a stick, the place-occupying quality of his wrist would naturally be transferred to the stick.

As to what the local signs consist of, there is considerable diversity of opinion. Indeed, it is a question of so much difficulty that I think we had better postpone the discussion of it until a more fitting time. I will only add that only the sensations of sight and touch and the muscular sense seem to have local signs.

(3.) How do we come to group our sensations together and regard them as qualities of external objects?

Briefly, *because they occur together, or in an invariable order.* Every moment of our waking lives we are experiencing sounds and touches and tastes and smells and colors. Those which we are in the habit of experiencing together, or in connection with each other, we refer, through the influence of the laws of association, to the same thing. A physician named *Jeseld* performed an operation upon a man who

was born blind, which restored the man's sight. When he first began to see, everything seemed to touch his eyes. Why? Because we can not *see* distance—because what we call seeing distance is interpreting the signs of distance—and he had not then learned the signs of distance. He knew cats and dogs perfectly by the sense of touch, but he could not distinguish them by sight. Why? Because he had not connected, by the law of association, the way a cat feels with the way a cat looks. Looking at a cat one day shortly after his sight was restored, and being in doubt as to what it was, he caught hold of it and said, "Ah, pussie, I shall know you next time." Why? Because he associated the impression she made upon his mind through sight with the impression made through touch. A child sees a robin on a sunflower,* and hears it sing. He does not connect the odor and color of the sunflower with the color and song of the robin, because they *do not habitually occur together*. If every time the child saw a sunflower a robin was on it, and if he never saw a robin except on a sunflower, he would connect them together as parts of one whole. The odor and feel and taste, color and solidity of an

*This illustration was suggested by one of Ward's in the *Encyclopædia Britannica*.

apple are all grouped together because they invariably occur together. When we have one of these experiences, the law of association by contiguity makes us think of the rest.

Summing up, then, (1) Attention to indefinite sensations makes them definite—enables us to take the first step towards the formation of a percept. (2) As these sensations become definite, the mind gradually becomes conscious of local *signs* which some of them possess, and by a *native, original power of interpretation refers the sensations possessing them to a certain place*. (3) Through the laws of association the sensations which occur together are referred to the same place and regarded as qualities of the same thing.

QUESTIONS ON THE TEXT.

1. Summarize the conclusions reached in the preceding lesson.
2. State and explain Sully's comparison.
3. What does the mind do to its sensations when it perceives?
4. What is the difference between a percept and an image?
5. Explain how the mind becomes conscious of definite sensations.
6. Explain how it comes to localize them.
7. What is a local sign, and how do you know our sensations have such signs?

8. How is it that the mind is able to interpret the local signs of sensations as signs of place?

9. How do we come to group our sensations together and regard them as qualities of external objects?

10. Explain the case of the boy whose sight was restored by an operation performed by Cheselden.

SUGGESTIVE QUESTIONS.

1. Show the identity of the two forms in which the problem of perception has been stated.

2. When you are in a car that is not moving and a train passes by, your own car seems to be in motion. Why?

3. The air of Italy is very clear, that of England very thick. What sort of mistakes would an Englishman make in judging of distance in Italy, and what sort would an Italian make in England, and why?

4. What evidences do young children show of mistakes in judging of distances?

5. A child of three wanted her mother to go up stairs with her in order that she might get the stars. Account for her mistake.

LESSON XIX.

THE CULTIVATION OF THE OBSERVING POWERS.

WHEN the mind, in the way described in the last lesson, has formed an idea of external objects, the perception of any object falls into two stages; in the first, it becomes conscious of a sensation; in the second, it interprets the sensation—regards it as the quality of some particular object. In perceiving a rose by the sense of smell, for instance, we are first conscious of a sensation of smell, and then we refer the sensation to a rose. In some cases the two stages are very sharply marked. "What is that I smell?" one asks. When that question is asked, he is simply conscious of a sensation—he has not referred it to its proper object. "Oh, it's a heliotrope," a minute after; his mind has taken the second step—he has referred the sensation to a particular object.

This enables us to see why it was so hard for us to realize that we are not conscious of the objects around us. The colors and tastes of objects that we find it so hard to believe that we are not conscious of, we *are* conscious of. But they are not parts of objects at all;

they are mental facts. We have repeatedly noticed the broad difference between mental facts—that are known directly only to the person experiencing them—and physical facts that are open to the observation of all men. The very color of the apple that you see, you think your neighbor sees also; but you are mistaken; the color of the apple to you is one sensation—to him another. They may be the same in the sense of being exactly like each other, though that will be the case only when your eyes are exactly similar, and when you see them from the same point of view—in no other.

We saw, some time ago, the importance of learning the facts of which we are conscious, since they, with necessary truths and necessary beliefs, constitute the foundation of everything we know and believe. But a good building requires not only a good foundation, but good materials. Be your foundation ever so good, unless your materials are good, your building will be worthless. Now, the knowledge gained through the senses is the material out of which our knowledge of the external world is constructed. If it is vague and indefinite, the knowledge based upon it will be vague and indefinite too; if it is inaccurate or false, so will the knowledge be that depends upon it.

But the knowledge gained through the senses may

be accurate as far as it goes, and yet be very imperfect, because of its incompleteness. A blind man is shut out from a whole world that is open to us. But he whose sense of sight is highly cultivated just as certainly has daily access to a world into which the ordinary man can not enter. He sees a thousand delicate colors, a thousand pleasing gradations of light and shade, that are as entirely beyond the range of the ordinary man's vision as though they came through a new sense. Read Ruskin's essay on the sky, and then say if the sky he saw and the sky that you and I see are the same. Clear or cloudy is the ordinary description of the sky. That would be as inadequate a description of Ruskin's sky as it would be of Americans to say that they are all men and women!

To Ruskin the sky is one of the many beautiful things in whose beauty his trained eye enables him to revel—a beauty as changing and as various as the face of the sea, and as charming as the beauty of those we love.

And this brings us to another reason for cultivating the senses of our pupils. We saw in the first lesson that one of the ways in which the study of Psychology would help us is that it would help us to see what we ought to aim at. Possibly you have some friend who

does not see that the development of the æsthetic powers of his pupils—of their power to perceive and appreciate beauty—is an important part of their education. If he does not, all you can do is to bid him think and think until he sees that a mind without the power to perceive and enjoy the beauty of the world is as truly abnormal and one-sided as a human body would be without arms. If you should go to the famous gallery in Dresden, you might look at Raphael's immortal painting and see nothing to admire. But if you did not, the fault would not lie in the picture. The beauty is there; and if a first study of it does not reveal it, you should go and go again—make it your companion, as it were, and compel it to reveal to you the charm that has so enraptured all the lovers of beautiful paintings since Raphael's time.

In like manner, if he does not *see* that the power to appreciate the beautiful is as truly to be desired as a good memory or excellent reasoning powers, you can not show it to him, nor can any one. But if he will make it a subject of careful study, he will come to see it as clearly as you do the axioms of geometry.

There are, then, three reasons why we should do what we can in the way of training the senses of our pupils: (1) it makes their knowledge more accurate;

(2) it makes it more complete; and (3) it tends to develop their power to see and appreciate the beauty of nature and art.

But what can we do in the way of cultivating the observing powers of our pupils? Of course all we can do is to put them in such positions, surround them with such influences, as will induce them to observe more closely, carefully, and methodically than they otherwise would have done. You remember that voluntary attention is of little value unless it develops interests. That fact enables us to see what we can do, and what we can not do, in the way of cultivating the observing powers of our pupils. For the cultivation of the observing powers really consists in the formation of habits of close and careful attention to objects perceived. All you can do to help your pupils form such habits is to give them motives for attending; but if they only attend under the pressure of your motives, if the objects attended to open up no interesting phases—if, in a word, voluntary attention does not develop interests—all the teaching in the world will not make them good observers. In the great majority of cases, however, there is enough of capacity for interest in natural objects to make that interest an effective motive in forming habits of careful

observation, if the right means are employed to develop it.

Of those means, perhaps the best the school authorities as a rule will not permit you to employ. If you should propose to close your school the middle of Friday afternoon, to take a walk with your pupils through the woods and across the fields for the purpose of calling their attention to the flowers and trees and leaves and birds, they would say that it would be a waste of time. They think it altogether preferable for you to employ your pupils in memorizing the names of the capitals of the various countries of the world, the lengths of the rivers, the heights of the mountains, and so on. But if you can not go with them, you can induce them to go and ask them to tell you what they saw. The knowledge that they will have to give an account of what they have seen will be a motive for observing more carefully than they otherwise would have done. And indeed, unless you are yourself a loving observer of nature, your company would be of little service to them. In the School of the Far-off Future, when men will universally realize the importance of the proper development of the various faculties of the mind as keenly as trained physiologists to-day realize the importance of

the health of the various organs of the body, in that School, I believe no teacher will be allowed to enter—at least in the primary grades—until he has stood certain tests that would seem very curious to us. Is the face of nature indifferent to him? Are her smiles in summer and her frowns in winter alike lost on him? Can he look upon the brooks that “fret” along their channels and the sheep and the cows grazing in the meadows and the wild roses growing along the hedge rows and hear the songs of birds with no feelings of gladness? If so, I believe he will be regarded as lacking an essential element of a teacher of boys and girls. The ideal teacher of the ideal school will look on the face of nature with something of the same fondness that the mother looks on the face of her child. As every act of her child is an object of interest to the mother, so every detail of nature will be of interest to this teacher, and he will watch the changes that pass over the face of nature as winter gives way to spring, and spring to summer, and summer gradually dies away into autumn, with something of the same sad and yet fond interest that the mother watches her child as she travels on the road to womanhood.

But we are not living in the future, and we have to take ourselves as we do our pupils—as we are, and

make the best of us. And it seems to me that if we do not care for nature we may realize the importance of helping our pupils care for it; and to do this, as I have said, the only thing we can do is to give them motives for attending to it more closely than they otherwise would have done. You might have them make lists of the various trees and flowers and plants and birds of the neighborhood, and note the dates when the trees begin to put forth their leaves and the flowers to bloom and the birds to build their nests. If the birds are of a migratory sort, you should have them observe when they come and when they go, and, in any case, what they feed on, and how they build their nests. You should have a school museum composed entirely of interesting objects that they have collected. In such ways you may induce them to become familiar with every bird and tree and flower and plant in the neighborhood, and during the process three-fourths of them will have acquired such an interest in nature as will make them good observers for life.

You can turn their fondness for drawing into account in the same direction. Have them draw not pictures, but real objects from memory, and the result will be that the next time the object is seen it will be

observed much more closely and the image of it will be fixed in the mind much more definitely.

You should give object lessons. But if these lessons are to have any value, they must be carefully prepared and carefully given. Some teachers seem to imagine that there is a virtue in an object lesson as such; but, in the nature of the case, this is not so. If an object lesson is of any use in cultivating the observing powers of your pupils, it is because it induces them to observe more closely than they otherwise would have done; if it does not do that, it will leave their observing powers just where it found them.

An object lesson may be made to serve two important purposes besides furnishing motives to your pupils to observe: You may make it a means of imparting knowledge, and of enlarging the range of their vocabulary.

When you are preparing an object lesson, you should make up your mind in precisely what ways you will reach these various ends. You will, of course, conduct it for the most part by asking questions. If you are dealing with little children, you will begin by asking them questions which they can answer with ease, *for the sake of interesting them in the lesson*. Children like to display their powers, and they like lessons which

give them opportunities to do that. But you will be careful to note that to interest them in the lesson *is by no means the same thing as interesting them in the object*. You interest them in the object when you ask them questions about it that they can not answer, but which they can find the answer to by more careful observation. Accordingly, a part of your preparation of an object lesson should consist of such a careful study of the object as will enable you to observe certain qualities which you think have escaped their attention, in order that you may be able to induce them to study it more carefully than they have ever done before, and give them the pleasure of finding out something for themselves.

You should carefully decide also precisely to what extent you wish to enlarge their vocabulary. If, for instance, you are giving a lesson on glass, you can arrange your questions so as to get them to tell you that they can see through it. Then you can tell them that things which can be seen through are transparent, and ask them to name as many transparent things as they can think of.

Compayre quotes a sensible paragraph from M. Buisson on this subject: "It is not desirable to have the object lesson begin and end at a fixed hour. Let

it be given on the occasion of a reading or writing lesson, or in connection with the dictation exercise, with the lesson in history, geography, or grammar. If it occupies two minutes instead of twenty, it will be only the better for that. Often it will consist, not in a series of consecutive questions, but in one spirited, precise, and pointed question, which will provoke a reply of the same sort."

QUESTIONS ON THE TEXT.

1. Summarize the conclusions reached in the last lesson.
2. Into what two stages does the perception of any object fall? Illustrate.
3. Why is it so hard to believe that we are not conscious of external objects?
4. State and illustrate the three reasons why the training of the senses is important.
5. What can we do in the way of training the senses of our pupils?
6. What do you regard as the best means of helping your pupils form habits of careful observation?
7. How should an object lesson be prepared, and for what purposes should object lessons be given?

SUGGESTIVE QUESTIONS.

1. What classes of objects are children most interested in?
2. Have you noticed instances in which the home surroundings of children exert an influence upon the objects they are interested in?
3. At what age are children most interested in objects?
4. Show the relation between the conclusions reached in this lesson and in the lessons on attention.

LESSON XX.

MEMORY.

WE can conceive of a mind with no capacity except the power to experience sensations—a mind limited to the present—a mind upon which its experiences leave no trace. Such a mind would be destitute of the power of *retention*. We can conceive of a mind like our own in that every sensation, every experience leaves “the mind different, as every physical change leaves the body different,” but unlike ours in that an experience once gone never returns. As every minute in that stately and solemn procession that we call the March of the Years goes by never to return, so we can conceive that the shadow of those experiences that we are conscious of from moment to moment, in spite of the fact that each of them left the mind different, might never fall across our conscious life. Such a mind would be without the power of *reproduction*. We can conceive of a mind, also, with laws of association like our own—a mind constantly conscious of images of some of its past experiences, but without the faintest notion that they were *images*—

a mind with the power to make pictures or copies of past events, but without the power to refer them to their original. Such a mind would be destitute of the power of *re-cognition*—re-knowing. Or we can conceive of a mind with the power to reproduce and re-know its past experiences, but without the power to locate them—a mind to which “yesterday,” and “last week,” and “last month,” and “last year” would mean the same thing—the past,—a mind all of whose recollections were like those we have sometimes been conscious of when we have seen a face that we were *sure* we had seen before, but with no idea of where or when. Such a mind would be without the power of *localization*.*

These four powers, then—retention, reproduction, recognition, and localization—constitute the power that we call memory. You would not, indeed, say that you do not remember a thing when you are not thinking about it. But you would say that a mind that did not possess all four of these powers can not remember as we can, and that one without the last two can not remember at all. A complete explanation of memory, then, would require a complete explanation of these four powers. But I shall not attempt a complete ex-

* See Baldwin's *Psychology*, page 151.

planation. My main purpose will be accomplished if we succeed in getting a clear idea of the problems that a complete explanation would undertake to solve.

In thinking about retention, we must be on our guard against being led into mistakes by the literal meaning of the word. The act of retaining seems to imply a place where things are retained, and so we sometimes permit ourselves to think of memory as a great storehouse, where all the lumber of our past experience is accumulated. But when we begin to think seriously, we find that this "storehouse" is a mere metaphor; that what we know is that an experience of yesterday—say the perception of a friend—recurs to us to-day in the form of an image. If you ask where the image was from the time it dropped out of consciousness until the time we thought of it to-day, the proper answer is, as Baldwin says, *Nowhere*. When I perceived my friend, I performed a mental act. When I ceased to perceive him, the act ceased, and with it the product of the act—the percept. When the image of him as I saw him yesterday is recalled to my mind, I remember him. Between the disappearance of the percept and the rise of the image my mind was inactive with reference to him; there was neither percept nor image of him in existence. The word *retention*,

then, does not denote an act, but states a fact—the fact that *experiences of the past leave the mind different*, since it often happens that we can recall them. The explanation of the fact is very difficult—perhaps, in the present state of our knowledge, impossible. We have learned from Socrates that it is better to remain in conscious ignorance than to delude ourselves with the appearance of knowledge. Let us, then, content ourselves for the time with the fact, without any attempt to account for it.

The laws in accordance with which ideas and images of our past experiences arise in our minds have already been considered. They are, as we know, the laws of association. We say that any thought, idea, or experience tends to recall similar thoughts, ideas, or experiences, and all other thoughts or experiences that were in the mind at the same time.

A consideration of this law will enable us to see how it happens that we are sometimes conscious of re-knowing things without being able to recall the place where, or the time when, the thing was originally known, or any of the circumstances connected with it. It is because the thing recalls the past experience *simply* by the law of association by similarity. Usually, as we know, along with the similar idea are re-

called other ideas or thoughts that were in the mind at the same time; and it is these other thoughts or ideas that enable us to *localize* our recollections. You saw a stranger yesterday in the post-office. To-day you see him again, and as soon as you see him you are conscious of that feeling of re-cognition—you know that you have seen him before. How do you know it? Because of the likeness between your percept of him and the image that arises in the mind. But suppose the image comes entirely unattended—suppose it comes without any of the other ideas that were in the mind at the same time—then you will have the feeling that you are re-knowing the person, but where or when you originally knew him you will be utterly unable to tell. You will not know where, for by supposition the image of the post-office does not come into your mind with the image of the person you saw there. You will not know when, for none of the images or thoughts that fix the time come with the image—no thought of yesterday, no thought of what you were or had been doing. As we can not locate the place of a thing except in relation to other places—London in relation to England, England to Europe, Europe to the earth, the earth to the solar system, the solar system to the universe, the universe to what?—so we can not

locate the time of an event except with reference to the time of other events, succeeding, preceding, or contemporaneous. (What does 1891 mean?) When, therefore, an image of a past experience arises in our minds, unattended by any of its former companions, we can only feel that we *re-know* it, without being able to tell where or when.

This explanation of the fact would seem to make the explanation of our ordinary experiences in memory very simple. Usually when we see a thing a second time that we remember to have seen before we remember when and where we saw it. The reason is as we now see, that the image of the past fact is attended by some of the ideas that were in the mind at the same time, so that its place and time are fixed. *But how do we know that images of which we are conscious in the present are copies of experiences that we had an hour ago, or rather what makes us believe it?* You sit down and begin to indulge in the pleasure of retrospection. You think of what happened an hour ago, yesterday, last year, ten years ago—when you were a child, first finding yourself in this strange world. But your base of operations is always the present. How is it that ideas *now in the mind* are *rejected, some of them an hour back, others a day,*

others a year, others a decade, others for a period not to be mentioned in such a public place? Precisely as in perception, we refer some of the sensations of color to objects ten feet away, others to objects a mile—ten miles—away, while all of them are in our own minds, so in memory we retroject ideas, all of which are experiences of the *present*, some of them an hour, others a day, others a week, others a score of years into our past lives. How are we able to do it?

It is the case of the Irishman's brogue over again. As we know the nationality of an Irishman by the way he speaks; as we refer our sensations to a certain place by their local signs; so we locate images of past experiences at a certain point in our past lives by their *temporal signs*. As the local signs are certain characteristics that all sensations, however different, which arise from the stimulation of the same part of the body have in common, so the temporal signs are certain common characteristics possessed by all ideas that we refer to some general point of time, however different those ideas may be. In other words, all the events of Christmas Day, 1888, that I am able to recall and localize at that point in the past are represented in my mind by ideas or images that have certain common characteristics. These common char-

acteristics—this brogue that enables me to refer my recollections to their proper time in the past—are called temporal signs.

QUESTIONS ON THE TEXT.

1. Define retention, reproduction, recognition, and localization, and show that they are essential to a complete act of memory.
2. Summarize the results reached in the chapter on the association of ideas.
3. How is it that we sometimes know that we have seen a thing without being able to tell where or when?
4. What was the illustration of the Irishman's brogue used to show in one of the chapters on Perception?
5. What is the difference between local and temporal signs?
6. How is it that the mind is able to regard its local signs as signs of place?
7. What is the difference between a percept and an image?
8. Show that we are able to locate a thing either in time or place only by its relation to other things.

SUGGESTIVE QUESTIONS.

1. Do you know any facts that indicate that retention is made possible through a modification of the brain that results from each of the experiences of the mind?
2. If that is the explanation of retention, how would you explain reproduction?
3. On the supposition that the mind has temporal signs, how would you explain its power to interpret them as signs of time?
4. At about what age do children begin to understand the meaning of *yesterday*, *last week*, etc.?
5. Why is it that this knowledge comes so late?
6. Are you sure that such a thing as absolute forgetfulness ever takes place?

LESSON XXI.

THE CULTIVATION OF THE MEMORY.

IN studying the association of ideas, we saw that mechanical association is that kind of association in consequence of which anything we are thinking of tends to make us think of something else we thought of at or about the same time; logical or rational association, that which tends to make us think of something between which and the thing we are thinking of the mind has perceived *inner* relations.

We only need to call to mind instances of the former to realize its comparative educational value. Consider, for example, the following: "Thou didst swear to me, upon a parcel-gilt goblet, sitting in my dolphin chamber, at the round table, by a sea-coal fire, upon Wednesday in Whitsun week, when the prince broke thy head for liking his father to a singing man of Windsor; thou didst swear to me then, as I was washing thy wound, to marry me, and make me my lady thy wife."—*Henry IV.* This, of course, is an example of mechanical association, and it enables us to realize that, so far as our thoughts are controlled by

that kind of association, they will be directed by chance and accident rather than intelligence.

When your pupils associate things logically, they are exercising and therefore developing the higher powers of their minds.

Logical or rational association is association according to some inner relation. But before this relation can form the basis of an association it must be apprehended, and this act of apprehension is an exercise of the higher powers of the mind. Fitch says that the difference between a wise man and one who is not wise consists less in the things he knows than in the way he knows them. The wise man knows things in their relations, I think he would say, has his knowledge classified, has associated what he knows rationally. In the same paragraph he observes that an historical fact is learned to little purpose unless it is seen in its bearing on some political, economical, or moral law. I am sure you agree with him. We all know that a teacher may know facts enough about history to pass an ordinary examination very creditably, and yet know them to very little purpose because he knows them in a purely mechanical way.

Another reason for helping our pupils cultivate

their logical memory is that they are more interested in what they have associated logically. To learn facts by means of the mechanical memory is an irksome task ; to apprehend the relations between those facts, to associate them logically is a delightful labor, especially if the pupil has been led to discern for himself the relations which form the basis of the association. Now interest, as we know, is a great help to the memory. But apart from that it is quite as important for you to interest your pupils for other reasons. If we interest our pupils, we do what we can to make them students for life, and that is a much more important matter than having them learn well any particular subject. Indeed, I think you will admit that if we had to choose between having our pupils careless and indifferent to study at school, and having them studious through life, it would be entirely wise for us to choose the latter.

Another reason for cultivating the logical memory is that any one with that kind of memory can use what he knows. Some one has said that a man could not stand under a tree with Edmund Burke during a shower of rain without perceiving that he was in the company of a very remarkable man. The reason doubtless was, not that Burke was continually saying

brilliant or witty things, but that he said nothing that was not to the point. A man may know a great deal mechanically, and yet be unable to use his knowledge, because he can not think of anything when he wants it, and can not see how he can use it when he does think of it. Such a person's mind is like a well-filled scrap bag; there is a good deal in it, but everything is in such disorder that you have to turn it upside down before you can get any particular thing out of it.

You have doubtless heard the saying, "Great memory, little wit." I think we can now see what truth there is in it. It is altogether possible for a person to have a great mechanical memory and have very little mind besides. Indeed, there are plenty of cases on record in which idiots have shown remarkable power of remembering facts mechanically. But to have a fine logical memory and a poor mind is an impossibility.

Educated persons often complain that their memory is not so good as it was in their youth. What they mean is that their mechanical memory is not so good. They have acquired the very excellent habit of fixing their attention on important matters and neglecting the trivial events that are not worth remembering; and because they forget them, while their

uneducated friends remember them, they imagine that their memory suffers by comparison. But it is not so. The educated man cultivates his logical memory, and neglects, for the most part, his mechanical memory; while the uneducated man does the exact opposite. It is natural, therefore, for the uneducated to have better mechanical memories than the educated. As Dr. Harris observes, if we want the child's memory we can have it. We can force ourselves to ignore the difference between the important and the unimportant, and attend impartially to everything that comes before us. So far as we succeed in doing this, we shall remember important and unimportant matters with equal accuracy. But is such a memory desirable? No, because in that case we shall remember important matters less accurately than we should have done otherwise.

But I do not mean to convey the impression that everything can be learned by means of the logical memory. Logical association consists in connecting facts together by means of some inner relation. But before we can see the relations between facts, we must know the facts themselves.

For this reason there is a place for the mechanical memory in education. But here you should note that

there are as many different memories, so to speak, as there are kinds of facts to be remembered. There is a memory of colors, a memory of dates, a memory of rocks, and so on. You know very well that some of your pupils have an excellent memory for geography, others for grammar, others for history, and so on.

Now, since memory is not one faculty, but many, it follows that there is no such thing as a universal cultivation of the memory. If you find your memory weak in any particular direction, what you ought to do is to practice it on the kind of things you find most difficultly in remembering. Dr. Harris gives an interesting and instructive account of his own efforts in cultivating his mechanical memory. When he was about eighteen, he tells us, he had great difficulty in remembering dates. He cultivated his memory for them in the following manner: The first day he learned the dates of accession of three or four English kings; the next day he learned two or three more, and reviewed those he learned the preceding day; the next day, again reviewing from the beginning, he added two or three more to the list, and so on, until he had thoroughly learned the entire list. After two or three months he found he had forgotten some of them, so he learned them again; and after two or three

years he repeated the operation. By such training, he tells us, his memory for dates was so improved that he has never since had any trouble in remembering such dates as he cared to remember. He cultivated his memory for names in a similar way.

It follows that verbal memorizing, although mechanical memorizing, is not necessarily bad. Fitch has stated with great clearness the circumstances under which it is valuable: "When the object is to have thoughts, facts, reasonings reproduced, seek to have them reproduced in the pupil's own words. Do not set the faculty of mere verbal memory to work. But when the words themselves in which a fact is embodied have some special fitness or beauty of their own—when they represent some scientific datum or central truth, which could not otherwise be so well expressed—then see that the form as well as the substance of the expression is learned by heart." Compayre, commenting on this, says that, "according to this, it is easy to fix the limit which verbal repetition should not pass. In grammar, the principal rules; in arithmetic, the definitions; in geometry, the theorems; in the sciences in general, the formulas; in history, a few summaries; in geography, the explanation of a few technical terms; in ethics, a few maxims—

these are the things which the child ought to know word for word—on the condition, of course, that he perfectly understands the meaning of what he recites, and that his attention is called not less to the thought than to the form of the expression." To this I would add that no week should be allowed to pass by in which the pupil is not encouraged to learn, word for word, some beautiful sentence or paragraph, and thus store his mind with beautiful thoughts, beautifully expressed, by reflection upon which he may cultivate his taste for beautiful literature.

And now I have said substantially what I intended about mechanical and rational association, and mechanical and rational memory. I believe we shall agree that, of all the subjects within the whole range of Psychology, there is scarcely one of more practical importance. We are constantly making use of the memory of our pupils. *How* we make use of it is the question, the answer to which largely determines the quality of our work. But however clearly we understand the difference between logical and mechanical memory, and the circumstances under which each ought to be cultivated, I am afraid we shall have difficulty in putting our ideas into practice. Why? *Because we can not help our pupils associate facts logically*

until they are so associated in our own minds. Pestalozzi thought that it was possible to *mechanize instruction* so perfectly that any teacher who had mastered the mechanism could succeed. He was profoundly mistaken, not merely because a mechanism won't run itself—because a method, however excellent, needs various adaptations to various cases—but because good teaching is impossible without an ample and rational knowledge of the subject of instruction.

As long as the addition, subtraction, multiplication, and division of whole numbers seem to be entirely disconnected operations, and each of these entirely disconnected from the addition, subtraction, multiplication, and division of common fractions, and these from the same operations in decimal fractions, we can not enable our pupils to associate the facts of arithmetic rationally, because they are not so associated in our own mind. In like manner, as long as we see no connection between the very different kinds of people who settled at Plymouth and Jamestown, and the differences between the people of Massachusetts and the people of Virginia at the close of the Revolutionary War; as long as we see no connection between these differences and their reluctance to unite together under a single strong government; as long as

we do not see how this reluctance could only be overcome by compromises in the Constitution which were in the nature of contradictions, which contradictions, under the influence of slavery, led to other contradictions—each party affirming its own view with passionate intensity—and these to the Civil War—until we see these things as clearly as the sun in the noon-day heavens, American history is a sealed book to us, and it will be a sealed book to our pupils so far as help from us is concerned, because the facts are associated in our own minds in a merely mechanical way. In like manner, until we realize in detail to what extent the character and history and institutions of a people are a matter of latitude, and longitude, and soil, and climate; until we see that the explanation of the building of a Chicago in fifty years is to be found in the facts of physical geography; until we see that, if the soil and climate and other physical conditions of the North and the South had been reversed, the parts they played in the Civil War would have been reversed—we can not teach geography properly, because we do not *know* geography in a rational or logical way.

In a word, to make a practical use of this distinction between logical and mechanical memory, we

must see it in the first place; and, in the second, we must know the subjects we undertake to teach in a logical or rational way, and the latter is just as indispensable as the former.

QUESTIONS ON THE TEXT.

1. Summarize the conclusions reached in the lessons on the associations of ideas and memory.
2. Analyze the quotation from Henry IV. in order to show that it was the result of mechanical association.
3. State the various reasons for cultivating the logical memory.
4. What does Fitch say is the difference between a wise man and one who is not wise?
5. How many memories has the mind?
6. How did Dr. Harris cultivate his memory for dates?
7. Under what circumstances is verbal memorizing desirable?
8. What did Pestalozzi think about mechanizing instruction, and why was he mistaken?
9. Illustrate the necessity of a rational knowledge of a subject in order to teach it well.

SUGGESTIVE QUESTIONS.

1. What light does this lesson throw on the kind of preparation a teacher should make?
2. Make a study of the children you meet to ascertain (1) the things they remember and why, and (2) the kind of memory they exercise most.
3. Which kind of memory should be chiefly exercised in the case of young pupils, and why?
4. "Betty," said a farmer's wife to her servant, "You must go to town for some things. You have such a bad

memory that you always forget something, but see if you can remember them all this time." "I'm very sorry, ma'am," says Betty, "that I've such a bad memory, but it's not my fault; I wish I had a better one." "Now mind," said her mistress, "listen carefully to what I tell you. I want suet and currants for the pudding." "Yes, ma'am, suet and currants." "Then I want leeks and barley for the broth; don't forget them." "No, ma'am, leeks and barley; I shan't forget." "Then I want a shoulder of mutton, a pound of tea, a pound of coffee, and six pounds of sugar. And as you go by the dressmaker's, tell her she must bring out calico for the lining, some black thread, and a piece of narrow tape." "Yes, ma'am, says Betty, preparing to depart." "Oh, at the grocer's get a jar of black currant jam," adds the mistress. The farmer, who has been quietly listening to this conversation, calls Betty back when she has started, and asks her what she is going to do in the town. "Well, sir, I'm going to get tea, sugar, a shoulder of mutton, coffee, coffee—let me see, there's something else." "That won't do," said the farmer; "you must arrange the things as the parson does his sermon, under different heads, or you won't remember them. Now, you have three things to think of—breakfast, dinner, and dressmaker." "Yes, sir." "What are you going to get for breakfast?" "Tea and coffee and sugar and jam," says Betty. "Where do you get these things?" "At the grocer's." "Very well. Now what will be the things put on the table at dinner?" "There'll be broth, meat, and pudding." "Now what have you to get for each of these?" "For the broth I have to get leeks and barley, for the meat I have to get a shoulder of mutton, and for the pudding I must get suet and currants." "Very good. Where will you get these things?" "I must get the leeks at the gardener's, the mutton and suet at the butcher's, and the barley and currants at the grocer's." "But you had something else to get at the grocer's." "Yes, sir, the things for breakfast—tea, coffee, sugar, and jam." "Very well. Then at the grocer's you have

four things to get for breakfast and two for dinner. When you go to the grocer's, think of one part of his counter as your breakfast table and another part as your dinner table, and go over the things wanted for breakfast and the things wanted for dinner. Then you will remember the four things for breakfast and the two for dinner. Then you will have two other places to go for the dinner. What are they?" "The gardener's for leeks, and the butcher's for meat and suet." "Very well. That is three of the places. What is the fourth?" "The dressmaker's to tell her to bring out calico, and thread, and tape for the dress." "Now," said her master, "I think you can tell me everything you are going for." "Yes," said Betty; "I'm going to the grocer's, the butcher's, and the gardener's. At the grocer's I'm going to get tea, coffee, sugar, and jam for breakfast, and barley and currants for dinner. But then I shall not have all the things for dinner, so I must go to the butcher's for a shoulder of mutton and suet, and for leeks to the gardener's. Then I must call at the dressmaker's to tell her to bring lining, tape, and thread for the dress." Off goes Betty and does everything she has to do. "Never tell us again," said her master, "that you can't help having a bad memory."—*Tate's Philosophy of Education*. What does this illustrate?

LESSON XXII.

IMAGINATION.

IF you ever watched the growth of the mind of a child, you doubtless noticed that he seemed to remember persons before he showed any signs of thinking of them when they are absent. A child shows in the most unmistakable ways that he remembers his father and mother some time before he gives any evidence of thinking of them when they are away. *The power of the mind to form ideas of things not present is called imagination.*

We may call imagination the image-making faculty, if we give a broad enough meaning to *image*. We can think not only of absent persons, but of tastes, touches, hopes, fears, etc., no longer experienced. If, then, we define imagination as the image-making faculty, we must remember that an image is the *mental representation of any experience whatever*.

There are two kinds of imagination. When a child cries for his absent mamma, the act of imagination evidently consists in holding before the mind a copy, more or less faithful, of the mother, as seen and

known. But the same child will soon think of things he has never seen—of things that have never come within the range of his experience. He will tell you of what he will do when he becomes a bird, or of good little girls putting a cat's eyes in after a bad dog has scratched them out—and much besides of the same sort. The first kind of imagination is called *reminiscent* or *reproductive*, since it reproduces past experiences; the second is called *constructive*, since it takes ideas or images furnished by the reproductive imagination and combines them into new wholes.

"But what is the difference," you at once ask, "between reproductive imagination and memory? I hear a song, and it makes me think of the friend whom I heard sing it a few days ago—an image of my friend as singing the song rises before my mind. This, I suppose, is both an act of memory and reproductive imagination; what is the difference between the two?"

To begin with, in its early stages, memory exists without imagination. A child who knows his mamma when he sees her, but can not think of her when she is absent, illustrates this.

"But when he begins to think of his absent mamma, as he will by and by, what, then, is the difference between memory and reproductive imagination? When

he thinks about her, does he not remember her, and is not his thought of her an image, and therefore the product of the imagination?" Yes; but there is a difference between simply thinking of her, or rather between simply *having the image of her in his mind*, and *knowing that image as the image of one he has seen*. The difference between reproductive imagination and constructive imagination is that the images resulting from reproductive imagination are copies of past experiences, while those resulting from constructive imagination are not. Now, it is altogether possible for one to suppose that what are really products of reproductive imagination are products of constructive imagination, *because the images resulting from the act of reproductive imagination are not accompanied by a recollection of the original experiences*.

We shall see the relation between them from another point of view if we remember that the exercise of the reproductive imagination is a part, of which the memory of an absent object is the whole. There can be no memory of an absent object unless the image of it is in the mind, and that image is the product of the reproductive imagination. But having the image of an absent object, and remembering the object, are not the same. *There is no complete act of memory of an ab-*

sent object until the image in the mind is recognized as the image of some particular object or thing already experienced. Moreover, while a complete act of memory of an absent object involves retention, reproduction, recognition, and localization, the imagination of it involves but two—retention and reproduction. If the image of a past object or experience comes unattended by any of the images that formed a part of its original escort, it can not be localized—*i. e.*, completely remembered—nevertheless it is imagined. Also, it may not be recognized; even then it is imagined.

There is not a moment when images of one sort or another are not in our minds. Sometimes we ourselves determine to a considerable extent their character. As Dr. Reid said, "We seem to treat the thoughts that present themselves to the fancy"—imagination—"in crowds as a great man treats the courtiers who attend at his levee. They are all ambitious of his attention. He goes round the circle, bestowing a bow upon one, a smile upon another, asks a short question of a third, while a fourth is honored with a particular conference; and the greater part have no particular mark of attention, but go as they came. It is true he can give no mark of his attention to those who were *not there*, but he has a sufficient

number for making a choice and a distinction." If those who were treated so coolly had at once left, while those upon whom the great man smiled had stayed till some of their friends and relatives—whom they themselves summoned because of their kind treatment—were honored at their expense, the case would exactly illustrate the influence that we exert, whenever we choose to, over the character of the images that throng through our minds. Those that we do not attend to, vanish; those that we do attend to, stay until we neglect them for the sake of those that come into our minds through their connection with them.

But sometimes the will abdicates, and lets one's thoughts take their own course. As the rider of a trusty horse might throw the reins on his neck, and let him wander at will across fields, through woods, over meadows, so we sometimes give full rein to our thoughts, and let them take us where they will. If we break in upon any such state for the purpose of making a study of it, I think that we shall usually find that the images in our minds are the products of constructive imagination—sometimes very grotesque ones.

To learn whether any particular image, or combination of images, is the product of reproductive or

constructive imagination, all we have to do is to learn whether or not it is a copy of a past experience. Our memories, of course, are defective, and we may be uncertain on that account; but, apart from that, we need be in no doubt whatever.

Applying this test, it is evident that when we learn anything from a book or from a friend we are exercising the constructive imagination. Reading is sometimes defined as thinking along prescribed lines; and if we carefully examine our own minds, we shall see that all thinking is done, for the most part, through images, either of things or words. When, then, we read, we form and combine images in a certain prescribed way—in the way prescribed by the language of the author—provided we understand him. When we listen to the conversation of a friend, we evidently do the same thing. Unless, therefore, our friend or book says precisely what we ourselves have thought, and in precisely the same way, it is evident that we grasp the thoughts by means of the constructive imagination.

When we find out a thing for ourselves, by the exercise of our own powers—the only other way in which we can learn anything—I think we shall see that is done through constructive imagination. A boy

has a problem in arithmetic to solve. What is the first thing for him to do? Understand it, as we say; and this, we have just seen, he can only do through constructive imagination. When he clearly grasps the conditions stated in the problem, he asks what follows from them? He reasons that such and such a result would follow—which result is likewise imaged constructively, and so on to the end. Kepler wanted to know the shape of the path which the planets make in their journeys round the sun. He made guess after guess, each time comparing his guess with the facts, until finally he was successful. This again was accomplished through the constructive imagination, was it not? Only by means of the constructive imagination could he form any sort of an idea of any particular planet, and each guess was an imaging of this planet pursuing a course that he had never seen it take. A child of one or two or three years, listens daily to conversations between his mamma and papa. Sometimes consciously—always consciously or unconsciously—he is trying to understand them. How does he succeed in learning the meaning of so many words? Precisely, for the most part, as Kepler discovered the shape of the planetary orbits—by success-
essing. By the time he is three he knows how

to use words that apply to purely mental processes—such as *know*, *think*, *believe*, *understand*. He thinks of—forms an image of—certain mental facts which he remembers in connection with certain words—brings images into a relation in which he has never experienced them, until he gets the right pair together—until he makes a successful guess. Sometimes we can catch him in the very act of constructively ascertaining the meaning of a word. When a child of two speaks of the “skin of a book” through an act of inductive reasoning, he has concluded that the outside of everything is its skin—and this conclusion, to be a conclusion at all, must be imaged in part in his mind.

Evidently, therefore, the constructive imagination is not monopolized by poets and painters and novelists. Whoever reads, whoever listens to a conversation intelligently, whoever thinks—imagines, and imagines constructively. “There are indeed as many different kinds”—or rather cases—“of imagination as there are kinds of intellectual activity.”

QUESTIONS ON THE TEXT

1. Define *imagination, image, percept*.
2. What does a complete act of memory involve?
3. State and illustrate the difference between imagination and memory.
4. State and explain the quotation from Dr. Reid.
5. What is active imagination? Passive?
6. What is the difference between reproductive and constructive imagination?
7. How do we read a book intelligently, or understand a conversation?
8. How does a child come to learn the meaning of words?

SUGGESTIVE QUESTIONS.

1. What makes possible the difference between the active and passive imagination?
2. Give examples of cases in which children used words incorrectly when they reasoned in the same way as they did when they used other words correctly.
3. Compare the imagination of children with that of older people, and explain the difference.

LESSON XXIII.

IMAGINATION.

IN the last lesson we saw that the imagination of popular thought differs widely from the imagination of which Psychology treats. When people in ordinary conversation speak of imagination, they mean a kind of constructive imagination—the kind that poets and painters and novelists and musicians possess in an unusually high degree—the power of combining ideas or images furnished by reproductive imagination into new wholes, without having received suggestions as to the combinations from any one else. But it is now plain that we, who understand the poems and paintings and novels that are the product of the constructive imagination, exercise constructive imagination. It does, indeed, require a higher power of it to combine images and groups of images originally than to do so under guidance—so much higher that some writers would give it another name and call it the creative imagination. But if we adopt their name we need to remember that the creative imagination of a Shakspeare, a Beethoven, a Thackeray, a Raphael,

does not differ in kind from that of the child who imagines himself becoming a bird.

This enables us to see why great works of art—works which are the product of a high power of constructive imagination—often wait a long time to get their proper appreciation. Talk to a child about the pleasure of study, and he will not understand you. His experience has not furnished him with the material for comprehending what you say. His idea of happiness is the possession of cake and candy in abundance, and toys without stint. A little girl, who wished to show her affection for her mamma, urged her papa to get "a wheelbarrow and a dollie" for her mamma when he went to town; and when he came back without them she was deeply grieved. She built her notion of happiness out of the materials furnished by her own experience, and had no idea that it was not valid for every one. Some great writers seem to be so superior to even their most highly cultivated contemporaries in their power of constructive imagination that the latter can not think the thoughts of the former even under their direction. Beethoven's Grand Symphony was unintelligible to his musical contemporaries, and Newton's Principia was beyond the comprehension of the best mathematicians of his time.

The intuitions of Beethoven and Newton, their perception of musical and mathematical truth, were so much more vivid and profound than those of their contemporaries that the products of their constructive imagination were unintelligible.

Constructive imagination is also very closely related to the feelings. We have already noticed two quite sharply contrasted cases in which constructive imagination works—the case in which its products are controlled by the will, and that in which the will exercises no control whatever over the play of images. The products of passive imagination—as we may call the latter—plainly depend upon the feelings. Tell me the character of the images that habitually pass through your mind, and I will tell you what you like. As you can tell the tastes of a gourmand by noticing what he eats, so you can determine a man's likes and dislikes by knowing the images upon which he habitually dwells. This explains the very great influence of the feelings on belief. Only so far as the facts of the world and of life get *imaged* in our minds do they influence belief; and those that we *image* are, for the most part, those that it gives us pleasure to think of—those that it gratifies some part of our emotional nature to think of.

It follows that the exercise of the imagination may be attended with very grave intellectual results. The desire to imagine pleasant things may be stronger than the desire to imagine things that are true. All men of strong prejudices are examples of this. They are so anxious to believe a particular thing—find so much pleasure in picturing it in their imagination and thinking of it as real—that they will not fairly consider the arguments that make against their favorite theory. That is the reason why strong partisans only read the newspapers of their own party. They do not want to read both sides of the question. They only want to see their own side strongly supported, that they may have the pleasure of dwelling upon arguments that support the conclusion they have made up their minds to believe.

But the constructive imagination is often exercised for the sake of the feelings. When you build air castles, what are you doing? Exercising the constructive imagination—bringing before your mind images of what you would like to be real. Why do you do it? Because it pleases you. That is the reason why most people are so fond of reading novels. The events which the novelist enables them to picture please them more than the prosaic realities of every-

day life. Sully has a paragraph on this subject that is worthy of careful attention. "The indulgence in these pleasures of the imagination," he says, "is legitimate within certain bounds. But it is attended with dangers. A youth whose mind dwells long on the wonders of romance may grow discontented with his actual surroundings, and so morally unfit for the work and duties of life. Or—what comes to much the same—he learns to satisfy himself with these imaginative indulgences, and so, by the habitual severance of feeling from will, gradually becomes incapable of deciding and acting—a result illustrated by the history of Coleridge and other dreamers." I read a story of a Russian lady which illustrates this. She went to the theater, and wept freely over the imaginary sufferings of the hero of the tragedy; while the knowledge that her coachman was shivering in the cold on the outside waiting for her did not cause the faintest suggestion of pity. Of course, if we read novels not merely for pleasure, but for their interpretations of life—for the light they throw upon our relations to our fellows—such a "severance of feeling from will" can not follow. It is for teachers and parents to see to it that novel-reading serves its proper educational purpose—the purpose of broadening and strengthening the imagination, and

preparing the will for its proper work by giving the feelings that are excited by it an active direction.

It follows from all this that what we will to do often depends upon constructive imagination. Men do rash things because they do not clearly realize the consequences of their conduct. Help a boy form the habit of clearly and fully realizing the probable consequences of his conduct—help him form the habit of realizing that the consequences of our acts depend not upon our wishes and intentions, but upon the nature of our acts—and you have gone a long way toward giving him the power and the habit of willing intelligently.

This brief survey of the relation of imagination to our mental life enables us to realize what indeed a consideration of its nature would have enabled us to see beforehand—that the part it plays in our mental life is of the very highest importance. Not reality, but what gets represented in our minds *as* reality—not what *is*, but what is *imaged*—affects our mental life. It is exceedingly interesting and instructive to note the naive self-importance of a child—the belief that appears in so many forms that the world exists for him. The stern relentlessness of nature—the stoic disregard desires and wishes with which she pushes on to

her own ends, trampling us under foot if we but cross her path—has not got imaged in his mind. And until it does, his attitude toward the world is precisely the same as though his thoughts were true. If, indeed, it is true—and is it not?—that all good causes depend upon the right training of the child, is it not evident what tremendous importance attaches to the right training of the faculty that constitutes the audience-chamber in which Reality gets its only hearing?

The accurate study of any subject is a training of the imagination, and yet there is scarcely one that does not tend to dispose the mind to be inhospitable to the images that represent certain phases of Reality. The specialist in mathematics is in danger of forgetting that not all reality is demonstrable; hints and suggestions and probabilities, that fall short of demonstration, he is in danger of despising. The specialist in literature is in danger of thinking of the attainment of truth as a too altogether easy matter. What did Shakspeare mean? What he—the student—finds in him. And he is in danger of being much too ready to project himself after the same fashion into the great Book of Nature, and get at the heart of her mysteries in the same easy way. The specialist in any branch of natural science is in danger of forgetting that there

are any facts except those that can be weighed and measured, or that anything is worthy of belief that can not be proved experimentally. The specialist in mind is, or rather was (it is scarcely true now that so much stress is laid on Physiological Psychology), in danger of undervaluing the methods of natural science—the methods that have so completely transformed the civilization of this century.

All this enables us to see that one of our great intellectual needs is breadth of culture, which is indeed, for the most part, but another name for that training which makes us disposed and able to give a fair hearing to all sides of Reality, and that we are in danger of missing it through too early specialization.

But while the various subjects mentioned above afford scope for the cultivation of the imagination, we shall, of course, bear in mind that the subjects especially adapted to its training in the public schools are history and geography. We should prepare to teach history in part by getting a thorough comprehension of the motives of the men who played a leading part in history; and we should endeavor to give our pupils such insight into their characters as to check the tendency to unqualified praise and blame. We should try to give them the power to hold in their minds

complex groups of facts, that they may see their relations to each other. In descriptive geography, we should try to leave in their minds definite and clear images of the countries they are studying. See the kind of knowledge of Tasmania Dr. Arnold wanted: "Will you describe to me the general aspect of the country round Hobart Town? To this day I never could meet with a description of the common face of the country about New York or Boston or Philadelphia, and therefore I have no distinct ideas of it. Is your country plain or undulating, your valleys deep or shallow, curving, or with steep sides and flat bottoms? Are your fields large or small, parted by hedges or stone walls, with single trees about them, or patches of wood here and there? Are there many scattered houses, and what are they built of—brick, wood, or stone? And what are the hills and streams like—ridges or with waving summits, with plain sides or indented with combs, full of springs or dry, and what is their geology?" Such a knowledge of the look of a country we want to get and give our pupils.

But there are other suggestions that I think we should get from this study of imagination. We have seen how universally active the constructive imagination is, and yet that it depends for its materials upon the

reproductive imagination. We see, therefore, from a new point of view the necessity of making a careful study of our pupils. You would not hire a man to build a house without furnishing the necessary materials. Be equally reasonable with your pupils, and do not expect them to build images out of nothing. Many a little boy or girl has an utterly erroneous idea of an ocean, because the teacher has not taken pains to dwell on the experiences the images of which would have made the required activity of the constructive imagination possible.

But with all the pains you may take, if you want to be sure that your pupils have performed the necessary acts of constructive imagination, there is but one way—by questioning. We are constantly talking to our pupils about matters that, by long reading and reflection, have become familiar to us. First comprehended with difficulty, they have become so simple that we forget how they looked when our minds got their first glimpse of them. We can hardly realize that what is so simple to us should be difficult to any one, and we never shall realize it save by everlasting questioning.

QUESTIONS ON THE TEXT.

1. Summarize the conclusions reached in the last lesson.
2. Contrast the ordinary ideas of imagination with that set forth in this lesson.
3. Why is it that the works of "creative imagination" are often beyond the comprehension of the age in which they were produced?
4. Show the influence of the feelings on constructive imagination, and of the constructive imagination on the feelings.
5. Account for strong partisanship.
6. What is "the severance of feeling from will?"
7. Show the place and importance of imagination in our mental life.
8. What is breadth of culture, and how can it be gained?

SUGGESTIVE QUESTIONS.

1. Mathematicians and musicians to-day understand with ease Newton's *Principia* and Beethoven's *Grand Symphony*; account for the fact.
2. Make a study of the minds of the children you meet for the purpose of learning (1) what they have formed images of; and (2) to what an extent their images are due to their social surroundings, and to what an extent to the common impulses of childhood.
3. How would you try to cultivate a spirit of open-mindedness?
4. What subject in the public school course offers the best material for this purpose?
5. How would you try to prevent the severance of feeling from will?
6. Do persons who are "naturally suspicious" get pleasure from indulging their suspicious, even when what they suspect is unpleasant?

LESSON XXIV.

CONCEPTION.

THE word "dog" evidently does not mean the same as "this dog." "This dog" may be a long-haired, long-nosed, long-eared black dog, with white spots on his back ; while "dog" is the name not only of this dog, but of all dogs whatever. The same is true, of course, of all general names. All general names are names of classes—names that are applicable to every individual of the class—while particular names, such as proper nouns and common nouns, limited by words like "this" and "that," are names that can be applied in the same sense to but one individual. How did the mind get this power—this power to use class-names intelligently? We never *see* a class ;* we only see individuals. Classes do not make themselves known to us through any of the senses. How, then, does the mind form an idea of a class? To answer that question is to state what the mind does in conception,

*It is, of course, understood that I am using the word "class" to denote an indefinite number of individuals that resemble each other in certain particulars.

for conception *is that act of the mind by which it forms an idea of a class, or that act of the mind that enables us to use general names intelligently.*

We have seen that our mental life begins with unclassified, unknown, indefinite, undifferentenced sensations—that the first step towards a knowledge of things consists in the transformation of what we can only describe as vague feeling into definite sensations of this and that character. I say the first *step*. We must be careful to note that this transformation is not *finished*, a child does not become conscious of definite sensations of sound and taste before it *begins* to take the second step—before it begins to *localize* its sensations. We must think of this transformation not as an instantaneous process, but as a gradual change. A change in the direction of decreasing indefiniteness in sensations is undoubtedly the first change in the direction of knowledge of things, or, indeed, of any knowledge whatever. But before any sensation has the definite character our sensations now have when we attend to them, the child begins to take the second step—it begins to localize its sensations.

But here again we must note that this feeling of place may have very different degrees of definiteness. Even in our mature experiences we are sometimes

conscious of sensations of pain without being able to locate them precisely, as when we have the toothache and don't know exactly which tooth aches. This process of localization, then, is at first a vague feeling of whereness; and before this vague feeling becomes a knowledge of a definite place—before the second step towards a knowledge of things has been fully taken—the third begins; the child's sensations are beginning to be grouped together and regarded as qualities of external objects.

Let us suppose the three steps taken; let us suppose that a child has come to know a long-haired, long-nosed, long-eared black dog, with white spots on his back, to such an extent that, when asked where the dog is, he looks at him, and says "dog" when he sees him, as soon as he begins to talk. In what does this knowledge consist? In the fact that he has associated certain sensations of color with certain sensations of touch—those which he has received from running his hand over the dog—and both these with the name dog. This is how it happens that when he sees or feels the dog he thinks of the name, and that when he hears the name he thinks of the dog. The sensations of color and touch and the name dog have become so tied together by association by contiguity that one always brings the other to his mind.

But now we need to remember that the pair so tied together is, strictly speaking, not one pair at all, but an indefinite number of pairs more or less closely resembling each other. No matter who says dog, whether papa or mamma or brother or sister or nurse, whether the word is pronounced in a high or low tone of voice, whether the speaker is one foot or ten feet away, the child thinks of dog. But the sensations of sound in each of these cases is different. No matter where he sees the dog, whether in doors or out; no matter what the dog is doing, whether eating or drinking, walking, running, standing, or lying down, the child recognizes him—thinks of his name. But the sensations of color in each of these cases is different. This looks like general knowledge to begin with. We are trying to learn how the mind forms general ideas—how it gains the power to use general names intelligently. It looks as though it exercises this power even in knowing individual objects. The spoken word dog is itself the name of a large class of sounds; for, as we have seen, it is not only a different sound in the mouth of every different speaker, but in no two cases do they exactly resemble each other. The sensations of color, also, received from the dog are not the same sensations, but an indefinitely large class of more or

less closely resembling sensations. The child, then, in recognizing the word dog whenever he hears it, and the sensations of color received from the dog whenever he sees him, seems to perform a mental act very much like recognizing any dog whenever he sees him; but that implies a knowledge of the class dog—implies, in a word, the exercise of the very power of conception we are trying to explain.

But are we not mistaken? Students of mind, from Aristotle down, have noticed that when a child begins to talk it calls all men papa indiscriminately. What is the explanation of this? It must be *either* that the child perceives the resemblance between other men and his papa, and applies the same name to them because of their resemblance—knowing, nevertheless, that they are different individuals—or *that he confuses every man with his papa, because he sees no difference between them*. If we accept the latter, we must say with Hamilton, that “in the mouths of children language at first expresses neither the precisely general nor the determinately individual, but the vague and confused,” and that this vague and confused idea, modified in one direction, becomes the definite knowledge of an individual, modified in another, the definite knowledge of a class. Papa, for example, would not mean

to a child his own father, neither would it be the name of a class perceived to consist of different individuals, but the name applied to resembling individuals not known to be different.

In discussing this question, we must try to get at the heart of the matter; we must try to separate what is merely accidental and incidental from what is essential. What is the essential fact maintained? It is that the first knowledge of children of the persons and things about them is not of persons and known things to be definite individuals, but of persons and things confused with each other, because of their resemblances. This may be true, and the contention of Aristotle and of many students of mind since his time—that children call all men papa, for example, indiscriminately—false. Children begin to talk at quite different stages of their development. If the theory is true, we may expect, therefore, to see evidences of this confusion in the language of some children when they begin to talk, and not in that of others.

I believe that the first knowledge of children is of this character: (1) *because the mind perceives resemblances more easily than differences*. I know two brothers whom at first I could scarcely tell apart; now, I see that they are so unlike that it is hard to realize

that I should ever have confused them. What is the explanation? *At first I saw resemblances only; not until I had seen them often did I note the differences between them.* Children's minds evidently work the same way. Ducks, geese, swans, are all ducks to them. And we may expect them to show as much less power in perceiving differences than we possess as their minds are less developed than ours. (2) *There are cases in which children unquestionably confuse different individuals, one of whom they know well, because of their resemblances.* Perez tells the following story of a child of thirteen months: "As one of his cousins was like his uncle, having the same sort of beard, and the same kind of figure and voice, the child treated him at once as an old acquaintance. He called him Toto (the name he had given to his uncle). . . . Seeing a pencil in his cousin's hand, he took it from him, put it in his mouth, and made with his lips the movements and sounds of a man who is smoking and puffing his smoke in the air. His uncle used to smoke. When he got down from the table he said, 'lou, lou, lou, lou,' in a tone of entreaty. This was explained to the cousin as signifying that he was to imitate the dog as his uncle was in the habit of doing to the child's great delight. Out in the garden the child made

another request, which his cousin did not understand, much to the astonishment of the former, who was accustomed to being instantly obeyed by his uncle. . . . His cousin, having been coached up in his part, humored, as far as possible, all the habits which his uncle had made necessary to the child; but some he replaced by ways of his own; and the end of it was, that after being with his cousin three weeks the child afterwards expected from his uncle all the gestures, tones of voice, games, indulgences, and acts of obedience which the new *Toto* had accustomed him to."

Such facts seem to show that the first knowledge of children is neither of individuals nor of classes. Not of individuals, because the child has only noted resemblances between things, or between the same thing seen at different times. But the perception of individuals is impossible without the perception of differences. Two men with exactly similar beard, same complexion, of the same size—exactly similar in every respect, and occupying the same position—would not be two men, but one. Two men also who seemed to be exactly alike in every respect would be regarded as the same person, however unlike they might be. Also, the first knowledge of children is not of classes, because, until they know individuals, they can not

know classes, since a class means and is nothing but a collection of individuals resembling each other in certain particulars. But their first ideas of things are vague, confused ideas of resemblances between things not known to be different. To avoid circumlocution, we will call this idea a *class-image*.

QUESTIONS ON THE TEXT.

1. Trace the progress of the mind from indefinite sensations to the knowledge of external objects.
2. What kind of knowledge do children first gain of external objects?
3. Justify your answer.
4. State the case reported by Perez. What does it prove?

SUGGESTIVE QUESTIONS.

1. Report any cases similar to the one reported by Perez, that have come under your observation.
2. Have you noticed children calling other men papa, and if so, did you notice whether they seemed to look upon them as strangers, or whether their manner towards them was the same as towards their own papa?
3. Can you prove by your observation of children that they perceive resemblances more easily than differences?
4. Can you prove by your own experience that you do the same thing?

LESSON XXV.

CONCEPTION.

SINCE a knowledge of class images antecedes a knowledge of individuals, to explain conception we have first to explain how the knowledge of class images externalized as things becomes a knowledge of definite individuals. Evidently the various steps or stages that mark the progress of the mind from those undifferentiated, indefinite sensations with which our mental life began to the formation of concepts are (1) the knowledge of class images externalized as things; (2) the knowledge of individuals; and (3) the formation of concepts.

To see how the knowledge of class images externalized as things becomes the knowledge of individuals, we must study our own experiences. Why did I confuse the two brothers mentioned in the last lesson? Because I saw no differences between them. It seems hard to realize that a child can see no difference between a large man with a full beard and a small one with none. But our powers of perceiving both resemblances and differences are much greater

than a child's; and if I could confuse two people whom I now see to be very unlike, we shall be able to realize that a child may see two very different things without being able to observe any difference between them. How did I finally gain the power to tell them apart? *By withdrawing my attention from them as wholes and fixing it upon individual features*—size, color of eyes, and the like. In precisely similar ways the child gains the power to distinguish individuals. And here we can see why it is so hard for him to acquire it. It is so easy for you to withdraw your attention from objects as wholes and fix it upon parts or qualities, but it is very hard for a child. The individual features are there, but he does not see them because he does not attend to them. But little by little he gains the power to fix his attention upon individual features, and as he acquires it he gains a knowledge of individuals.

When a child distinguishes individuals because he notes some of the differences between them, it is easy to see that he will first note only the most striking differences. The first difference that he notes between a big black dog and a small white one is probably a difference in color. The class image of dog has become, on the one hand, the perception of individ-

ual dogs. Seeing no difference between them except in color, and noticing that they are both called dogs, he drops out of his class image of dog the element of color, and associates what is left with the name *dog* whenever he hears it. *What is left of the class image when the element of color is dropped out of it is a rudimentary concept, and the act of mind by which it is reached is conception.*

Let us observe closely the steps that led from the percept of the individual to the concept of the class. The first step taken by the child towards the formation of the concept *consisted in fixing his attention upon both dogs, or upon one dog and an image of the other at the same time.* Let us call this first step comparison. The second *consisted in withdrawing his attention from the point of unlikeness—color—and fixing it upon their points of likeness.* Precisely as an essential step towards a knowledge of individuals consists in withdrawing the attention from the objects as wholes and fixing it upon individual parts or features, so an essential step towards a formation of concepts consists in withdrawing the attention from the points in which the objects compared are seen to be unlike, and fixing it upon those in which they are seen to be like. Let us

call this step abstraction. The third step *consisted in applying the name dog to all other objects having the same characteristics—in making the name general by making it the name of a class.* Let us call this generalization. These three acts of the mind, then—comparison, or the fixing of the attention upon two or more objects at the same time; abstraction, or withdrawing it from some of their unlikenesses and putting it upon some of their likenesses; generalization, or the making of a name general by making it the name of all the individuals possessing similar qualities—are the three acts that constitute conception.

We see at once that the concept—the product of conception—is liable to constant change. The only difference that the child first observes between the two dogs is a difference in color. As he observes them more and more carefully he notices more and more differences—the word *dog* means a smaller and smaller number of attributes. And when he hears the name applied to other animals he naturally puts them in the same class, and the meaning of *dog* is correspondingly reduced, although each separate act of abstraction is followed by an act of generalization—the extending of the name so reduced in meaning to all objects having the common characteristics he has observed.

But while a more careful and a wider observation of dogs in this way reduces the concept, it may enlarge it in another way. The child may notice points of resemblance before unobserved. In this way his concept is made to include more attributes—the class name comes to have a richer meaning.

The attention that results in comparison and abstraction may be either voluntary or involuntary, and therefore concepts may be formed voluntarily or involuntarily. We know from our study of attention that the concepts that a child forms in the first years of his life will, for the most part, be formed involuntarily because he is not able to give much voluntary attention.

Of course, concepts formed on this by-rule-of-thumb manner are indistinct and inaccurate. They are sure to contain attributes that careful observation would exclude, and not to include others that such observation would bring to light. But we must remember that it is exactly this kind of concepts that constitutes the furniture of a child's mind when he first starts to school. To transform these indistinct and inaccurate concepts into those that are distinct and accurate—to enlarge the number of concepts—is evidently an important part of education.

We shall be able to do this more intelligently if we remember not only the manner in which they are formed, but the condition upon which their formation depends. That condition is *the perception of resemblances between different individuals*. Until resemblances are perceived, no concept of the resembling objects can be formed. That is why a child finds it so hard to understand the meaning of numbers. Four horses, four cats, four toys, etc., resemble each other in being four, but they seem to the young child to have nothing in common—and therefore he does not know what you mean when you call them all fours. Not till his mind is able to detach the fact common to them all will he be able to understand you.

The clear perception of this truth will save us from the mistake into which some eminent writers on Pedagogy* have fallen—of supposing that because the child perceives resemblances more easily than differences that, therefore, we should begin by teaching him the widest classes—for instance, plants—before any of the sub-classes—roses, geraniums, sun-flowers, etc. Manifestly a child can form a concept of roses he can not of plants, because he can see the resemblances between the former when he can not see between the latter.

See Rosmini's "Method in Education," page 17.

QUESTIONS ON THE TEXT.

1. Make a careful summary of the last lesson.
2. Define class image. What is meant by "externalized as things?"
3. What is the first thing to be done in explaining conception, and why?
4. How does a child come to know individual persons and things?
5. State and explain the two directions in which the class image is modified.
6. State and explain the three processes involved in conception.
7. What is the difference between percept, image, and concept?
8. In what two ways are concepts formed?
9. What kind of concepts has a child when he first starts to school?
10. Upon what condition does the formation of concepts depend?
11. What mistake did Rosmini make, and why?

SUGGESTIVE QUESTIONS.

1. At what age do children generally begin to understand the meaning of numbers?
2. Why is it desirable to use a variety of objects—sticks, straws, grains of corn, etc.—in teaching children to count?
3. Does this lesson throw any light on the question as to the proper age for taking up the study of grammar?

LESSON XXVI.

CONCEPTION.

WE saw in the last lesson that involuntary concepts are almost certain to be indistinct and inaccurate, and that when children first start to school, unless they have been carefully instructed at home, nearly all their concepts are of this kind. They have observed the objects they see about them closely enough to learn their names, and talk about them with a certain degree of intelligence. Because they can apply their names correctly, teachers are in great danger of thinking that the corresponding concepts are all that they need to be. But that is a mistake. "While an external object may be viewed by thousands in common," said Professor S. S. Green, "the idea or image of it addresses itself only to the individual consciousness. My idea or image of it is mine alone—the reward of careless observation, if imperfect; of attentive, careful, and varied observation, if correct. Between mine and yours a great gulf is fixed. No man can pass from mine to yours, or from yours to mine. *Neither in any proper sense of*

the term can mine be conveyed to you. Words do not convey thoughts; they are not the vehicles of thoughts in any true sense of that term. A word is simply a common symbol which each associates with his own idea or image.

“Neither can I compare mine with yours except through the mediation of external objects. And then how now do I know that they are alike; that a measure called a foot, for instance, seems as long to you as to me? My idea of a new object which you and I observe together may be very imperfect. By it I may attribute to the object what does not belong to it, take from it what does, distort its form, or otherwise pervert it. Suppose, now, at the time of observation we agree upon a *word* as a *sign* or *symbol* for the object or the idea of it. The object is withdrawn; the idea only remains—imperfect, in my case; complete and vivid in yours. The sign is employed. Does it bring back the original object? By no means. Does it convey my idea to your mind? Nothing of the kind; you would be disgusted with the shapeless image. Does it convey yours to me? No; I should be delighted at the sight. What does it effect? *It becomes the occasion for each to call up his own image.* Does each now contemplate the same thing? What

multitudes of dissimilar images instantly spring up at the announcement of the same symbol!—dissimilar not because of anything in the *one* source whence they are derived, but because of either an inattentive and imperfect *observation* of that source, or of some constitutional or habitual defect in the use of the perceptive faculty."

What, then, can we do to make these involuntary, and therefore indistinct and inaccurate, concepts distinct and accurate? When a child starts to school, he attaches a meaning to *near, far, narrow*, and many similar words, but his concept of them is based entirely on his own observations, and is therefore very inaccurate. Shall we seek to make his concepts accurate by definitions? No; for he can not understand our definitions unless he has accurate concepts corresponding to the words we use. We must get him to follow the path that leads to accurate concepts; we must get him to compare a large enough variety of near and narrow objects to enable him to apprehend the one common quality that such objects possess—we must get him to compare, abstract, and generalize.

But while it is necessary for you to bring the mind of your pupil into contact with particulars in order to make his concepts accurate, the very necessity of

doing it shows the need of exercising care as to the kind of particulars you select. Why is a child's concept of narrow inaccurate? Because he has considered only certain kinds of narrow things—narrow ribbons, narrow paths, narrow planks, and the like. A young man told me that until he was eight years old he thought all rivers were like the one near his home. We see, therefore, the necessity of selecting particulars *that show all the extreme varieties*.*

Begin also with particulars that give prominence to the main idea. If you are teaching your pupils what an island is, call their attention first to an island far from the mainland, in order that the characteristic quality of an island may be brought out prominently.

Select your particulars also solely with reference to the end in view. Do not select such as have an interest in themselves, because they attract the attention to features that are not included in the concept—features, therefore, that you wish the child to ignore.

Finally, stick to your purpose until it is accomplished. Accumulate particular after particular until the desired concept is formed, allowing yourself to be tempted into no digression whatever. Of course we should pursue the same method in developing new concepts.

*See Bain's *Education as a Science*, page 92.

But in most cases our pupils have no names for the new concepts we help them to form until we give them. When should we give them? Evidently not until they need them. Language serves two purposes. In the first place, it enables us to preserve the results of our own thinking. When we have performed these processes of comparison, abstraction, and generalization—when we have formed a concept—if we did not give it a name, there would be nothing to fix it in our minds. When we associate a name with the concept, the name enables us to recall it without repeating the processes of comparison, abstraction, and generalization that in the first place enabled us to form it. But we have no use for general names to assist us in fixing concepts in our minds until we have formed the concepts of which they are names. When we consider the other use of language, we are led to the same conclusion. The other use of language, of course, is to communicate ideas. As we have already seen, no such thing, strictly speaking, is possible. What you do when you are said to communicate ideas is to occasion your hearer or reader to recall ideas and make combinations of ideas similar to those in your own mind. This you are able to do by using a sign or symbol with which he has associated the same idea you have in your mind.

Evidently, then, language can not be used to communicate ideas, or rather to occasion the recalling of ideas, until you have yourself associated a sign or symbol with the idea you wish to be recalled, and until your hearer has formed the same association.

Hence the absurdity of teaching words without ideas. Words are like paper money; their value depends on what they stand for. As you would be none the richer for possessing Confederate money to the amount of a million of dollars, so your pupils would be none the wiser for being able to repeat book after book by heart unless the words were the signs of ideas in their minds. *Words without ideas are an irredeemable paper currency.*

It is the practical recognition of this truth that has revolutionized the best schools of the country in the last quarter of a century. Pestalozzi well called "the blind use of words in matters of instruction the fundamental error." He was not the first educational reformer who insisted on it. Montaigne, Comenius, Locke, Rousseau, had all insisted on the same idea, but they were in advance of their time; the world was not ready to listen to them. But in 1806, after Prussia was thoroughly beaten by Napoleon at the battle of Jena; when her capital city was in the hands of her

conqueror, and she lay humiliated at his feet, it occurred to some of her leading men that the regeneration of the nation was to be sought in education. In this way it happened that the ideas of Pestalozzi were embodied in the schools of Germany, from which country they have gone into the schools of every civilized country in the world.*

In what did the reform inaugurated by Pestalozzi consist? *In the substitution of the intelligent for the blind use of words.* He reversed the educational engine.† Before his time, teachers expected their pupils to go from words to ideas; he taught them to go from ideas to words. He brought out the fact upon which I have been insisting—that words are utterly powerless to create ideas; that all they can do is to help the pupil

* It is to me a very interesting fact that Pestalozzi went to Paris early in this century in order to try to induce Napoleon to reform the educational system of France in accordance with his ideas. Napoleon said he had no time to bother his head with questions of A, B, C. Prussia took the time, and the result was that when Prussia and France met again on the field of battle nearly seventy years later, the soldiers of Prussia, educated in accordance with Pestalozzi's ideas, completely routed the armies of France.

† When I wrote this sentence I did not know that Pestalozzi had used a similar illustration: "The public common school coach . . . must not simply be better horsed, . . . it must be turned round and brought on an entirely new road."

to recall and combine ideas already formed. With Pestalozzi, therefore, and with those who have been imbued with his theories, the important matter is *the forming of clear and definite ideas*.

But how can such ideas be formed? By comparison, abstraction, and generalization, and by combining concepts so formed into complex concepts. That is why Pestalozzian teachers have made so much use of object lessons. Realizing that the only way the mind can form ideas of objects is by comparing them, then abstracting some quality, then generalizing, they have given systematic courses of Object Lessons in order that they might develop clear and definite concepts of objects in the minds of their pupils.

But systematic object teaching is not the only or indeed the chief way of teaching in harmony with this law of the mind. Object teaching will be the method chiefly employed by intelligent primary teachers, because the great intellectual need of young children is clear and definite concepts of *objects*. Since all our concepts are either simple or complex, and since, of course, simple concepts must precede complex concepts, evidently the first step in education should consist in furnishing the mind with a stock of simple concepts. And since the mind of a child is for

the most part employed with objects, since his interests lead him to direct his attention to the external world, plainly the thing to be done is to give him simple concepts of *objects*. But whatever the subject of thought, in order to get its simple concepts the mind must take the same path, pursue the same course, compare, abstract, generalize.

Whatever the nature of the facts studied, whether objects that can be brought into the recitation room, or those that are physically inaccessible, or facts that can not be correctly described as objects, such as the facts of history, mental facts, mathematical facts, the intelligent teacher will lead his pupils to begin with an examination and comparison of them, then go on to note their resemblances and differences, then to make generalizations, unless he is sure that they have a stock of perfectly definite, simple concepts, by the combination of which they can form the complex concepts he desires. Such a method of teaching has well been called the Objective Method or Objective Teaching, since it is an application of the method of teaching by Object Lessons to every department of instruction.

QUESTIONS ON THE TEXT.

1. Make a careful summary of the two preceding lessons.
2. What are the two uses of language?
3. In what sense can we communicate ideas?
4. How can we make indistinct and inaccurate concepts distinct and accurate?
5. What kind of particulars should we select, and why?
6. In what did the reform inaugurated by Pestalozzi consist?
7. What is the difference between object and objective teaching?

SUGGESTIVE QUESTIONS.

1. What is the difference between simple and complex concepts?
2. Strictly speaking, can we have simple concepts of *objects*?
3. Mention as many distinct and accurate concepts that a child of six is likely to have, as you can think of.
4. What differences would you expect to find between the concepts of a child who has lived in the country, and those of a child who has lived in a city?
5. Talk with a child of six and endeavor to ascertain his concept of sky, star, sun, moon, and other objects inaccessible to him, that he hears mentioned in daily conversation?

LESSON XXVII.

CONCEPTION.

THE great importance of the Objective Method of teaching inclines me to think that it will be for us to spend a little more time in making an effort to get a thorough comprehension of it—such a comprehension as will enable us to use it from day to day. To this end, I venture to quote further from Professor S. S. Green. "The Objective Method," he says, "is that which takes into account the whole realm of Nature and Art so far as the child has examined and assumes as known only what the child knows—and what the teacher knows—and works from the well-known to the obscurely known, and so onward and upward until the learner can enter the fields of science or abstract thought. It is that which develops the abstract from the concrete—which develops the *idea* and then gives the *term*. It is that which appeals to the intelligence of the child, and that through the senses until clear and vivid concepts are formed, and then uses these concepts as something *real* and *vital*. It is that which follows Nature's order—the thing, the con-

cept, the word; so that when this order is reversed—the word, the concept, the thing—the chain of connection shall not be broken. The word shall instantly occasion the concept, and the concept shall be accompanied with the firm conviction of a corresponding external reality. It is that which insists upon something besides mere empty verbal expressions in every school exercise—in other words, expression and thought in place of expression and no thought.

“It is that which makes the school a place where the child comes in contact with *realities* just such as appeal to his common sense as when he roamed at pleasure in the fields, and not a place for irksome idleness. It is that which relieves a child's task only by making it *intelligible* and *possible*, not by taking the burden from him. It bids him examine for himself, discriminate for himself, and express for himself—the teacher, the while, standing by to give hints and suggestions, not to relieve the labor. In short, it is that which addresses itself directly to the eye external or internal, which summons to its aid things present or things absent, things past or things to come, and bids them yield the lessons which they infold—which deals with actual existence and not with empty dreams—a living *realism* and not a fossil *dogmatism*.

" It will aid any teacher in correcting dogmatic tendencies by enlivening his lessons and giving zest to his instructions. He will draw from the heavens above and from the earth beneath, or from the waters under the earth, from the world without and the world within. He will not measure his lessons by pages, nor progress by fluency of utterance. He will dwell in living thought, surrounded by living thinkers, leaving at every point the impress of an objective and a subjective reality. To him, an exercise in geography will not be a stupid verbatim recitation of descriptive paragraphs, but a stretching out of the mental vision to see in living picture, ocean and continent, mountain and valley, river and lake, not on a level plain, but rounded up to conform to the curvature of a vast globe. The description of a prairie on fire, by the aid of the imagination, will be wrought up into a brilliant object lesson. A reading lesson descriptive of a thunder storm on Mt. Washington will be something more than a mere conformity to the rules of the elocutionist. It will be accompanied by a concept wrought into the child's mind, outstripped in grandeur only by the scene itself. The mind's eye will see the old mountain itself with its surroundings of gorge and cliff, of wood-land and barren rock, of deep ravine and

craggy peak. It will see the majestic thunder cloud moving up, with its snow-white summits resting on wall as black as midnight darkness. The ear will almost hear the peals of muttering thunder as they reverberate from hill to hill."

This long extract is worth all the study we can find time to put upon it. The thorough comprehension and the practical appreciation of it will revolutionize our methods of teaching as completely as have been the methods of teaching in the best schools of the country in the last twenty-five years. But there are two or three sentences in it that are especially worthy of attention. Professor Green says that the Objective Method appeals to the intelligence of the child *through the senses until clear and vivid concepts are formed, and then uses these concepts as something real and vital*. What does he mean?

I said in the last lesson that whatever the nature of the facts studied, whether objects that can be brought into the recitation room, such as coal, glass, water, and the like, or those that are physically inaccessible, such as are studied in geography or astronomy, or facts which can not be correctly described as objects, such as mental facts, historical facts, and the like, the Objective Method of teaching leads the

pupil to begin with an examination of the facts; instead of beginning with inferences *about* the facts, it puts the pupil face to face with the facts, and leads him to make his own inferences. How is that possible when we are not dealing with objects in the immediate presence of the pupil?

When we are dealing with facts or objects that our pupils can not observe for themselves, we must develop in their minds, as nearly as we can, the same vivid ideas that would result from a careful observation of the reality. That is what Professor Green means in the sentence to which I have called your attention. A concept so vivid as to be something real and vital, is a concept that can be used in forming complex concepts of things only a little less vivid than would result from a first hand observation of the reality. He means the same thing when he says that the Objective Method takes into account the whole realm of Nature and Art so far as the child has examined it; assumes as known only what the child knows—not what the teacher knows. For so long as the teacher keeps within the child's knowledge, he presents to him simple concepts that he can combine into complex concepts, which enable him to clearly and vividly realize facts and realities which

are beyond the range of his observation, but which he can use in comparing, abstracting, and generalizing, as though he had seen them for himself.

When Professor Green says that the Objective Method addresses itself to the eye, external or internal, he means to call attention to the fact that there are realities which can not be cognized by the senses, such as mental facts, but which, nevertheless, are to be studied in the same way.

This lesson enables us to see that one of the favorite doctrines of current pedagogy—first the idea, then the word—is inaccurate. In primary instruction it does indeed state with great accuracy the proper method of proceeding for the most part. But even here the teacher must sometimes violate it. No primary teacher can always confine himself to objects that have sometimes been within the range of the pupil's observation. He must sometimes take concepts formed from actual observation and build out of them concepts of realities that the pupil has never seen. A more accurate statement is—first the reality, then the play of the mind about the reality. I use the somewhat indefinite phrase, "play of the mind," because a more definite expression would not be sufficiently comprehensive. In some cases, what you

want from your pupils is not primarily intellectual action, or action of the knowing side of the mind at all. You wish to bring their mind face to face with a certain reality in order to excite the appropriate feelings. That, for instance, would be your object in teaching such a reading-lesson as the one described by Professor Green. The same is true, for the most part, in all teaching of literature. You wish to get the thoughts and sentiments of the piece in the minds of your pupils in order that they may have the proper feelings—appreciation, admiration, and the like. In such cases in the maxim: First the reality, and then the play of the mind about the reality—"the play of the mind" means, for the most part, a certain activity of the emotional side of the mind.

But even when the play of the mind you seek to occasion is a certain activity of the intellect, the kinds of intellectual activity that the Objective Method aims at are so different in different circumstances that any very definite term will not accurately describe them. The play of the mind desired may be the formation of a concept—say the concept of roundness. In that case the reality consists of round objects. You call on of the child to round objects in order y fix his attention upon their shape, neg-

lecting all their other qualities. Or the play of the mind desired may be the making of a definition—say a definition of roundness. Here the reality is his own concept of roundness; the play of the mind desired is the accurate description of that concept. Or the play of the mind wanted may be a description of a process—say the formulation of a rule in arithmetic. Here there are two sets of realities: (1) The conditions stated in the problem. You bring them clearly before his mind, in order that he may see for himself the path he must take in order to reach the solution. (2) Having solved the problem, you want him to describe the process, and this is the second reality. You want him to fix his mind upon it so attentively that he can give an accurate description of it.

In the following example the play of the mind desired is an inference from a fact. Your class learns from you or a book—so far as the Objective Method is concerned it makes no difference which—that the Constitution of the United States forbade Congress to pass any law prohibiting the importation of slaves prior to 1808, and then that Congress passed such laws in 1808—just as soon as the Constitution made it possible for them to do it—unanimously. You ask your class what they infer from that. They will be likely

to say that it indicates that Congress wanted to do all it could to limit slavery. Without saying whether they are mistaken or not, you go on and tell them of the penalty Congress affixed to the violation of the law, and then call their attention to the fact that, although the law was constantly violated and everybody knew it, this penalty was very rarely inflicted, and then ask what that signifies. Here the reality is an historical fact, and the play of the mind about the reality that you are seeking to occasion is an inference based on the reality.

If we have the clearest possible comprehension of the Objective Method, we may fail in our attempts to apply it, because we try to bring the minds of our pupils into contact with realities which they can not comprehend—try, in other words, to bring their minds into contact with realities with which they can not be brought into contact in their state of development. You could not give a blind boy an object lesson based on the sense of sight. No more can you intelligently use the Objective Method when the realities are beyond the range of your pupil's comprehension. And here we see another reason for making a careful study of our pupils—that we may learn what realities they can comprehend.

Further, it must be borne in mind that the Objec-

tive Method* is not the best method to use when our aim is to communicate information. But so far as you aim to supply to the minds of your pupils the conditions of development, so far, in one word, as your aim is the strengthening and unfolding of all their powers, so far you should aim to use the Objective Method.

QUESTIONS ON THE TEXT.

1. Give a general description of the Objective Method.
2. What does Professor Green mean by "real and vital concepts?"
3. Illustrate at length the formula—"first the reality, and then the play of the mind about the reality."
4. For what formula is it proposed as a substitute, and why?
5. Why may we fail in our attempts to apply the Objective Method?
6. Illustrate your answer from your own experience.

SUGGESTIVE QUESTIONS.

1. Is there any contradiction between the quotation made from Professor Green in this lesson and the one in the last?

*It doubtless has not escaped the attention of my careful readers that the Objective Method is based in part on laws of the mind which we have not yet considered. Those laws, however, are so generally known that I thought it would conduce to clearness to assume that they would be known, and discuss the Objective Method in connection with Object teaching, which is but a single application of it.

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LESSON XXVIII.

JUDGMENT.

WE have seen that our mental life begins with undifferentiated sensations; that the first step towards knowledge consists in their gradual transformation into definite sensations; that while they are thus being made definite they begin to be localized; that before they are definitely localized they begin to be gathered together in groups and thought of as qualities of objects; that in the first stage of the perception of objects, only their prominent, salient features—those in which small classes resemble each other—are perceived, and that, therefore, individuals are confused with each other, not perceived as individuals; that the state of mind that results from the confusion of individuals—the class image—gradually changes into two very unlike things—a percept and a concept; that, on the one hand, it becomes a percept through the definite perception of differences; on the other, a concept through the perception of resemblances between individuals perceived to be individual.

Through the greater part of these experiences the

mind has been active in a way to which, so far, we have paid no attention. When we study so complex a thing as the human mind, we have to study its various phases or activities in succession; but we must remember that what we study successively exists contemporaneously.

We shall get a clearer idea of the activity of which I speak if we consider it first in a simple and very common form. I see a man coming down the street. At first I am uncertain whether it is John Smith or his brother. But as I look at him closely I notice a scar on his right cheek, just under his eye, and then I remember that John Smith once received a severe wound there. Immediately my mind passes from its state of doubt into a state of certainty—I say, 'That man is John Smith.

Manifestly such an act of the mind is rendered possible by the laws of association. Through the laws of association I thought of the name of John Smith and of his brother. But there is a wide difference between the final act of my mind and the simple result of the laws of association. As long as my mental state is due entirely to the laws of association, I have a percept and two images in mind—the percept of the man before me, and the images of John Smith and his

brother; but when I see the scar—when I am no longer in doubt—the percept and the image of John Smith are fused into one, and, expressing this, I say, This man is John Smith. Such a mental act is called a judgment, and the words in which we express it are called a proposition.

If I had known the man was John Smith as soon as I saw him, it is evident that there would have been no conscious assertion expressed, or capable of being expressed, by the words That man is John Smith. There was a conscious assertion, because there was, so to speak, a vacillation on the part of my percept. It stood midway between my image of John Smith and my image of his brother. Because I was conscious of this vacillation, I was conscious of my uncertainty, or rather *in* this vacillation my uncertainty consisted. But if, as soon as I had seen John Smith, the image of him as seen before had coalesced or fused with my percept, the act would have been so automatic that I should have not been conscious of it.

You can prove the truth of this by your own experience. As you went to school this morning, did you say or think to yourself, that is a tree, that is a house, that is a cow, as you passed these several objects? No, you merely recognized them—knew them

directly—and were conscious of no mental assertion whatever. But suppose the cow had been wrapped in a buffalo robe, so as to look unlike any animal you had ever seen before. At a first glance you would not have recognized it. There would have been the same vacillation between your percept and the competing images that we have already observed in my experience. But when you had seen through the disguise, all but one of the competing images would have vanished; you would have performed a conscious mental act that can only be described by a proposition—That is a cow.

We can now see at what point in our mental life this conscious act first appeared. We have seen that a complete act of memory consists of retention, reproduction, recognition, and localization, and that memory begins to develop before imagination. Evidently, therefore, the mind recognizes things before it forms images of them when they are absent. Now this conscious act, which we have called judgment, first appears when there is an object before the mind of which it has a percept, *and when the mind is uncertain to which of two images to refer it.* If a child, familiar with oranges, sees a lemon for the first time, he at once classes it as an orange because of their likeness—there

is no conscious act of judgment. But if he is familiar with both and the names of both, when he sees an orange at a little distance, by the law of association by similarity he may think of both an orange and a lemon—the image of both may arise in his mind—and his percept may vacillate between the two. When he gets nearer, and notices the peculiar shape and color of the object, he says, 'That is an orange. Evidently such a conscious act is not possible until the imagination is so far developed that two or more images arise in the mind in connection with the same percept, which the mind is not able to refer to either.

If we examine the three judgments we have considered—expressed in the propositions, 'That is John Smith, 'That is a cow, 'That is an orange—we shall see that they consist in the fusion or coalescence of two states of consciousness—a percept and an image in the first, a percept and a concept in the second and third. We need to note (1) that this fusion or coalescence is the way our thoughts *sometimes behave* when we pass from a state of doubt to a state of belief; (2) that although it is thoughts or states of consciousness that coalesce, *the belief does not relate to states of consciousness, but to some kind of reality.** The reality may be

* See Baldwin's Psychology, page 286.

the reality of external nature, as when I say, That is an orange. Or the reality of literature. Thousands of books have been written upon the question of Hamlet's insanity. If I say he was insane, my proposition expresses a belief about a reality in literature. Or the reality of mythology. A student of the classics, on the way to recitation, is running over his lesson in his mind. He asks himself, How did Minerva originate? He is in doubt. Suddenly something brings the forgotten fact to his mind. He remembers that she sprang from the head of Jupiter. His memory is an assertion of a reality in mythology. Or it may be a reality of mental facts. I say, The concept man and the concept rational animal are one and the same. Here the reality asserted is a certain relation between mental facts.

If we examine what takes place in our minds when we perform the judgment expressed by the proposition, Minerva sprang from the head of Jove, we shall see that there is no such fusion or coalescence between the thoughts that stand for the subject and predicate as takes place when we judge That is John Smith. The reason plainly is because of *the difference in the things asserted*. In the last case we assert identity. I see that the individual before me has all the charac-

teristics of John Smith, because he *is* John Smith. In the first, we make an assertion about the origin of Minerva; we say not that she is, but that she sprang from, the head of Jove. So when I say, I dreamed last night, I make a still different assertion—I assert a different kind of fact. But no matter what we assert, we shall find, in the period of doubt that preceded the assertion, no fixed relations between the thoughts or concepts or states of mind that represent the various parts of the proposition that we finally assert. “I don't know whether that is John Smith or his brother.” As long as I am in uncertainty, my percept tends now towards the image of John Smith, now towards that of his brother, according to my estimate of probabilities. When I pass from a state of doubt to a state of certainty, my percept assumes a definite and fixed relation towards the image of John Smith. “I don't remember whether Minerva sprang from the head of Jupiter or the head of Apollo.” Here again there is the same lack of definiteness and fixedness in the relations between the thoughts expressed by *Minerva*, *sprang from*, *head of Jupiter*, *head of Apollo*. But when I say: “I remember now—she sprang from the head of Jupiter,” this lack of definiteness disappears;
are transformed into a new whole, or rather the

first three are, each of them sustaining a definite and fixed relation towards the rest—a relation which they resume whenever I think of them, unless my belief changes.

We see, then, not only that a judgment is that act of the mind that enables us to use a proposition intelligently, but we see what the act is. *It is the mental assertion of some kind of reality—the transformation of separate units or elements of thought into one whole, in which each sustains definite and fixed relations towards the rest.*

QUESTIONS ON THE TEXT.

1. State and illustrate what judgment is.
2. When do we make unconscious assertions, and why?
3. Under what circumstances do these unconscious assertions become conscious?
4. State and illustrate the various kinds of reality to which our judgments refer.
5. State and illustrate the difference (1) between the mere association of ideas and judgment, (2) between doubt and belief.

SUGGESTIVE QUESTIONS.

1. State the various causes to which, in your opinion, judgments are due.
2. Show that judgments could never have originated from the mere association of ideas.

LESSON XXIX.

JUDGMENT.

SUPPOSE you should have a conversation with a man from the moon, and should explain to him the meaning of *water*, *quench*, and *thirst*, without showing him the relations which these facts actually bear to each other. When he thinks of the three at the same time, they have only a mechanical connection in his mind—the same kind of connection that exists between the thought of a Chinaman and the thought of a steam engine when the child thinks of the two at the same time because he first saw them together. But when *you* think of them together, you assert a real relation between the facts *water* and *thirst*—they are no longer mechanically juxtaposed, *but parts of one logical whole*.

There is a conscious mental assertion only when this act of logical relating for some reason becomes a matter of attention. You say, That is a cow, only after you have been in doubt as to what animal you are looking at, or when you see it in some unexpected place, as in a public park. Some Psychologists con-

fine the term judgment to these *conscious* assertions of the mind. Assertions made unconsciously they refuse to call judgments, simply because they are made unconsciously. But assuredly those Psychologists take the sounder position who hold that whenever thoughts assume that fixed and definite relation we have seen they have in a judgment, whenever they become parts of a logical whole, there is an act of judgment, whether the act is conscious or not. *The essence of an act of judgment consists in this logical relating of thoughts.* To refuse to call it a judgment because it takes place so rapidly and unobtrusively as to escape the eye of consciousness is to use language in a way that does not conduce to clearness of thinking.

We may, indeed, properly enough mark the distinction between them by putting them into different classes. We may call the judgments made unconsciously, implicit, and those made consciously, explicit. Evidently the mind made implicit judgments when it contemplated what we have called class images. Evidently, also, when the consciousness of a class image becomes the perception of an individual thing, the judgment is still implicit. And as every modification of a class image in the direction of an individual is an act of implicit judgment, so every

modification of a concept is an act of explicit judgment. Suppose the first concept that the child makes of a rose is not of a rose as a rose, but as a plant, it is the result of an act of judgment—This is a plant. When he modifies his concept so as to make it include some of the attributes of a flower, this modification is still the work of a judgment—This plant is a flower. When he modifies it still further to make it include some of the attributes of roses, and then of that variety of roses called La France, it is still the work of judgment—This flower is a rose, this rose is a La France. In a word, the formation of a concept and each step in its subsequent modification is the work of the mind as judgment.

Explicit judgments are usually classified according to the propositions used to express them. "This man is a lawyer," a categorical proposition, is said to express a categorical judgment. "This man is either a lawyer or a doctor," a disjunctive proposition, is said to express a disjunctive judgment. "If this man is a lawyer, he is not a doctor," a conditional proposition, is said to express a conditional judgment. But we can not ascertain the character of a judgment by examining the proposition used to express it. *A categorical judgment is one in which the predicate is asserted of the*

subject absolutely and unconditionally. Now, a categorical proposition may be the expression of that kind of a judgment, and it may not be. One man says, *The sun will rise to-morrow morning*, and his proposition expresses a categorical judgment—the possibility even that the sun will not rise has scarcely occurred to him. An astronomer says the same thing, but mentally qualifies his assertion—*If nothing happens to the earth or the sun to prevent it.* A metaphysician mentally qualifies the same assertion with the condition—*If things behave in the future as they have done in the past.** The last two use a categorical proposition to express a conditional judgment. So, likewise, a conditional proposition may be used to express a categorical judgment. I say—*If he is a lawyer, he is not a doctor.* I mean, Men do not practice law and medicine at the same time, which is a categorical judgment. A child says, *If I do not cry, mamma will give me candy*—meaning simply that she will get the candy if she does not cry, and therefore her conditional proposition expresses a conditional judgment.

When we make a judgment about an entire class, our judgment is universal; when about a part of a class, it is particular. All trees have branches, is a proposi-

* See Lesson VI.

tion expressing a judgment about the entire class of trees; it is, therefore, universal. Some trees are green in winter, is a proposition expressing a judgment about a part of a class; it is, therefore, particular. Affirmative judgments are those in which something is affirmed; negative, those in which something is denied.

The common opinion is that the beliefs (judgments) of men—excepting those that we have called necessary truths and necessary beliefs—are based on processes of reasoning. Nothing can be more erroneous. The credulity of children is proverbial; but if we get our facts at first hand, if we study “the living learning, playing child,” we shall see that he is quite as remarkable for incredulity as for credulity. The explanation is simple: *He tends to believe the first suggestion that comes into his mind, no matter from what source; and since his belief is not the result of any rational process, he can not be made to disbelieve it in any rational way.* Hence it happens that he is very credulous in reference to any matter about which he has no ideas; but let the idea once get possession of his mind, and he is quite as remarkable for incredulity as before for credulity. A father was showing his little girl—three years old—a cistern, and she was

looking at it with great interest, when she suddenly drew back, and cried out, in a frightened tone, "Oh, papa, you are going to put me in there!" and no amount of persuasion would induce her to consent to look at it again, *although the father had never threatened her with any kind of physical punishment, and there was absolutely nothing in her experience which would serve as a reason for her belief.* The explanation is that the idea occurred to her, and its mere presence in her mind was a sufficient cause for belief. The same child got in a passion of fear because her father playfully remarked, one day when he had a caller, that she must stay with him to keep the man from hurting him. Not anticipating any such effect from his remark, he tried to soothe her by assuring her that it was not so— that he was only playing—but all to no purpose. *She did not believe it because he said it—because of her trust in him—and therefore she would not disbelieve it when he said it was not so.* Study your "elementary text-book," and you will find abundant illustrations of this truth—that belief about every thing that comes within the range of a child's experience antedates reason; that what reason does, for the most part, in the early years of a child's life, is to cause him to abandon beliefs that are plainly at variance with experience.

If we study the larger child—the man with a child's mind—an uneducated man—we shall have the same truth forced upon us. If the beliefs of men were due to processes of reasoning, where they have not reasoned they would not believe. But do we find it so? Is it not true that the men who have the most positive opinions on the largest variety of subjects—so far as they have ever heard of them—are precisely those who have the least right to them? Socrates, we remember, was counted the wisest man in Athens, because he alone resisted his natural tendency to believe in the absence of evidence—he alone would not delude himself with the conceit of knowledge without the reality; and it would scarcely be too much to say that the intellectual strength of men is in inverse proportion to the number of things they are absolutely certain of. If this be true, it is hard to overestimate the importance of the work that education should do in this direction. How to make men believe what is true, how to keep them from believing what is false, how to keep them from having opinions upon matters in reference to which their study and investigation, or rather the lack of both, give them no right to an opinion, is surely a question of the very greatest im-

portance.* Manifestly the way to answer it *is to bring up* the rational side of the mind, to develop it and train it so that it may be strong enough to cope with the believing—judging—propensities of the mind. What we can do in this direction, therefore, it will be proper for us to discuss after we have made a study of reasoning.

QUESTIONS ON THE TEXT.

1. Make a careful summary of the preceding lesson.
2. What is the essence of an act of judgment?
3. State and illustrate the difference between explicit and implicit judgments.

*I do not, of course, mean to intimate that we should have no opinions about matters that we have not personally investigated. We take and ought to take the opinion of some men about law, and others about medicine, and others about particular sciences, and so on. But we should clearly realize the difference between holding an opinion on trust and holding it as the result of our own investigations. If we do, we shall see we have no right to an opinion at all—on trust—where there is a decided difference of opinion among specialists. If all I know about the appearance of a thing I have learned from the reports of two men, and if these are directly opposed to each other on all the essential points, then plainly I know nothing about it. In like manner, if I take my conclusions from specialists—as I must to be reasonable, when I have not studied the matter—then, when they disagree widely, there is no reason why I should take the opinion of one rather than another. I have, therefore, in such a case, no right to an opinion.

4. What are the first implicit judgments?
5. How are concepts successively modified so as to include a larger and larger number of attributes?
6. State the difference between categorical, disjunctive and hypothetical judgments.
7. Show that we can not tell the character of a judgment by examining the proposition used to express it.
8. Show that children often believe things because of the mere presence of ideas in their minds.
9. What are necessary truths and necessary beliefs?
10. In what did the wisdom of Socrates consist?
11. What lesson does this teach us?

SUGGESTIVE QUESTIONS.

1. Why is it important for us to believe what is true?
2. Have you observed beliefs in children that you could only explain by the theory stated in the text?
3. Have you observed a difference in children in this respect? Do some appear more ready to believe without reason than others?

LESSON XXX.

REASONING.

WE saw in the last lesson that children *tend* to believe the first suggestion that comes into their minds, no matter from what source. Some Psychologists go much further than this. Höffding, for instance, says: "It must be with dawning consciousness as with dream consciousness—all that offers is at first taken for current coin,"* since to such a consciousness there is no ground for a distinction between the world of possibility and the world of fact and reality. This argument is that, from the very nature of the mind, it follows that, in the beginning of its mental life, a child must accept its ideas or suggestions as true.† But we have here nothing to do

*Outlines of Psychology, page 131.

†That acute critic and profound student of human nature, Walter Bagehot, wrote a suggestive paragraph on this point: "In true metaphysics, I believe that, contrary to common opinion, unbelief far oftener needs a reason and requires an effort than belief. Naturally, and if man were made according to the pattern of the logicians, he would say: 'When I see a valid argument, I will believe; and till I see such argument, I will not believe.' But, in fact, every idea vividly before us

with such *a priori* reasoning. Our business is to make a patient study of facts; to carefully observe children, in order that we may learn whether there is a tendency to believe as true every suggestion that enters their minds; and if so, to what extent. But here, as always, we must guard against the propensity which, as we have seen, is such an active principle of human nature—the disposition to let our beliefs run clean out of sight of the facts upon which they are based, and assert a universal conclusion upon the basis of a few observations of two or three children. Knowing the influence of feeling on belief, one would naturally suppose that children would be more likely to show the tendency in reference to matters that excite their feelings. So far as my observations go, they tend to confirm the truth of this supposition. We should expect also that children of a decidedly emotional tempera-

soon appears to us to be true, unless we keep our perceptions of the arguments which prove it untrue, and voluntarily coerce our minds to remember its falsehood. 'All clear ideas are true,' was for ages a philosophical maxim; and though no maxim can be more unsound, none can be more exactly conformable to ordinary human nature. The child resolutely accepts every idea which passes through its brain as true; it has no distinct conception of an idea which is strong, bright, and permanent, but which is false too. The mere presentation of an idea, unless we are careful about it, or unless there is within some unusual resistance, makes us believe it."

ment would be more likely to show it than those of a quieter temperament. But plainly we have no right to an opinion on this point until we have observed a large number of children, or until we have carefully studied the results of competent observers.

But the child very soon begins to form judgments that we can put into quite a different class. When he sees a train coming, and runs into the house because he is afraid of it, his judgment, *The train will hurt me if I stay in the yard*, is the result of the mere presence of the suggestion in his mind. The suggestion, of course, is due to the association of ideas; the belief, however, is due, as we have just seen, to quite another cause. But when a child, who was burned by his soup yesterday, refuses to touch it to-day because he sees it smoking, his judgment, *The soup will burn me if I put it in my mouth*, can not be explained in the same way. He does, of course, think of the possible burn because of the association of ideas, but he believes it because of a process that might be roughly described as follows: *Yesterday's soup smoked and burnt me; therefore to-day's soup, which smokes also, will burn me. He makes a judgment about past experience the ground of a judgment about future experience; he goes from the known to the unknown. A*

little boy once made the direct assertion, "Snow is sugar; for snow is white, and so is sugar."* *Because* snow and sugar are both white, he concluded that they are the same.

Let us see if we can find any judgment to serve as a basis or reason for the first one. Does the child think *The train will hurt me if I stay in the yard because other trains have hurt me there?* or *because mamma told me it would hurt me if I stayed there?* No. He does not base the judgment on anything; he assumes it. He does not go from the known to the unknown; he assumes the unknown. His belief is not mediate—reached through other beliefs—but immediate. Now, the process of basing judgments on judgments—of reaching beliefs through beliefs—is called reasoning. *Reasoning, then, is the art of going from the known to the unknown, of basing judgments on judgments, reaching beliefs through beliefs.*

We are reasoning every moment of our lives when we are awake. You awake in the morning and glance at the clock to see what time it is. You know that the object you are looking at is a clock by a process of reasoning. It looks thus and so, and therefore you say it is a clock. You say that it is half-past six, and

*See Hoffding's Psychology, page 132.

therefore you must get up. You infer that that is the correct time, because you have found your clock reliable in the past; and when the hands have been in the position they now are, you have learned that it was half-past six. You get up and begin to dress—every act which you perform is based on a process of reasoning. There was a time in your life when you could not do this or that simply by willing to do it. The child of two can not button his dress. And when he learns to do it once, he will be able to do it again by an act of reasoning. He will reason: I did thus and so yesterday morning when I buttoned my dress, and therefore, as I wish to button it again, I will do the same thing again. You go out and sit down to breakfast. Why do you do it? You are reasoning again. You are hungry, and as eating has satisfied your hunger in the past, you think it will do it again. You do not drink coffee, because you drank it yesterday and had a headache, and you reason that the coffee was the cause. Some one comes into the room, and you say, "Good morning, Mr. —," naming a friend of yours. How do you know who it is? By an act of reasoning. Your friend looks thus and so, and as this gentleman looks the same way, you conclude that he and your friend are the same person. Further than

that, you know that he is a person—a living, conscious being like yourself—by an act of reasoning. He acts like a person, and therefore you think he is one. These examples give us some idea of the part which reasoning plays in our mental life. It is reasoning that gives memory its value. Why is it useful for us to know the past? As a guide to the future. Inasmuch as the past has been thus and so, we *reason* that the same will be true in the future; and without reason we should have no right to have any opinions about the future whatever. You are not, of course, conscious of reasoning in such cases. You say you *see* the clock, *see* your friend, and so on, when you really infer in each case. You speak thus because you are not conscious of reasoning—because the reasoning is *implicit*, like some of the judgments noted in the last lesson.

Evidently the first reasonings of a child are of this implicit character. We have seen that the last stage in the process of perception consists in grouping sensations together and regarding them as qualities of external objects. Evidently this grouping is the result of reasoning. A child comes to expect that the color of an apple will be followed, under certain circumstances, by the taste and odor of an apple—comes to

think of a certain color, taste, odor, etc., as qualities of the same object; and these judgments, since they are based on other judgments, are products of reasoning.

All recognition and classification are products of reasoning. The child first confuses different persons with each other, as we have seen; implicitly judges, *the man I see now and the man I saw yesterday are the same*, because he sees no differences between them. This implicit judgment is the result of implicit reasoning:

This man looks thus and so;

Papa looks the same way;

*Therefore this man is papa.**

When his growing mind enables him to see the difference between his father and other men—when he recognizes his father when he sees him—his act of recognition is a judgment which results from an act of implicit reasoning identical in character with the one just described.

The unconscious classifications of objects that we make in perception are due to the same cause. A child taught according to Rosmini's method would first be able to recognize or classify a given object as

*Cf. Harris, Introduction to the Study of Philosophy, page 98; also Herbert Spencer's Psychology, Vol. II, page 116.

a plant, then as a flower, then as a rose, and last of all, say, as a Marechal Niel. If the ground of his recognition were consciously before him, we could describe the movement of his mind as follows:

This object has such and such qualities (those, viz., of a plant, or a flower, or a rose, or a Marechal Niel, according to the judgment);

A plant (or a flower, or a rose, or a Marechal Niel) has the same qualities;

Therefore this object is a plant (or a flower, or a rose, or a Marechal Niel).

Suppose, after he has learned to recognize a Marechal Niel whenever he sees it, I show him a *Perle des Jardines*, in order to test the accuracy of his knowledge, and ask him what that is. He will be likely to say that it is a Marechal Niel—reasoning in the unconscious, implicit way already described. If I ask him how he knows it, his reasoning becomes conscious; he answers, because it has such and such characteristics—supposing him to be developed enough to describe his concepts. This conscious act of reasoning may be expressed in this form:

All roses that have such and such qualities are Marechal Niels;

This rose has those qualities;

Therefore it is a Marechal Niel.

His conclusion, of course, is incorrect, because one of his premises is wrong.

In all of these cases we notice that the judgment through which the mind passes to a conclusion is a judgment about some particular fact, so far as it is consciously in the mind at all; and if we examine our minds to see the course they take in the reasonings of everyday life, we shall find that we generally reason from some particular fact to some particular fact. You are going to take a train at half past eleven, and you must give yourself ten minutes to go to the depot. You look at your watch; the hands point fifteen minutes past eleven. Remembering that it was five minutes slow yesterday, you hurry off at once. Why? Because you believe it is twenty minutes past eleven, since your watch was five minutes slow yesterday. Because your watch was five minutes slow yesterday, you believe it is five minutes slow to-day; *you reason from a particular fact to a particular fact.* As you go out of the gate you notice threatening clouds in the west. You go back and get your umbrella, as you think it is likely to rain. *From the particular judgment, The clouds look thus and so, you go directly to the particular judgment, It is likely to rain.*

But suppose, in either case, I dispute your inference; suppose I say that it is only fifteen minutes past eleven, or that it is not likely to rain? You seek to justify your conclusion; you fix your attention on the considerations that seem to you to prove it. You say, I have found by long experience that my watch is reliable, and since it was five minutes slow yesterday, I know that it is five minutes slow to-day. Or, you point to such and such characteristics of the clouds, and say, Clouds that look that way threaten rain. In the first case you seek to justify your inference from your conclusion by appealing to particular facts; in the second, by appealing to a universal proposition. Now that illustrates the difference between deductive and inductive reasoning. *Inference is always from particulars to particulars.* But when the mind retraces its steps in order to find the proof of its conclusion, it may find it *either* in a general proposition, *or* in particular propositions. In the first case the reasoning is called *deductive*; in the second, *inductive*. *Deductive and inductive reasoning, then, are not so much two kinds of reasoning as two modes of proof—two modes of exhibiting to ourselves or others the grounds of inferences already drawn.* When we prove a conclusion by a general proposi-

tion, the reasoning is called deductive ; when by particular propositions, it is called inductive.

QUESTIONS ON THE TEXT.

1. What is *a priori* reasoning?
2. By what *a priori* reasoning does Hoffding seek to show that children first hold all their ideas to be true?
3. Illustrate the difference between such judgments and reasoning.
4. Illustrate the extent to which we reason.
5. What is the difference between implicit and explicit reasoning?
6. What is the difference between inference and proof?
7. State and define and illustrate the two kinds of proof.

SUGGESTIVE QUESTIONS.

1. A child heard a servant say that a certain musical instrument was a harp ; her mother afterwards told her that it was an harmonica, but she insisted that it was a harp. Explain it.

LESSON XXXI.

REASONING.

WE saw in the last lesson that reasoning is going from the known to the unknown, and that we reason from known particular facts to unknown particular facts; that the difference between deductive and inductive reasoning is rather a difference in the method of proving conclusions already reached than a difference in the method of reaching them; that when we appeal to a universal proposition to prove our conclusion, the reasoning is called deductive; inductive when we appeal to one or more particular propositions.

But how is it that I am able to find the proof of a fact in particular propositions? When you say, "I know that this is a Marechal Niel because I know that all the roses that have the characteristics of this rose are Marechal Niels," if I disagree with you it is because I don't believe your premise. *Admitting your premise*, that all the roses that have the characteristics of this rose are Marechal Niels, I must admit your conclusion. But when the child argues, "Sugar is

white, Snow is white, 'Therefore snow is sugar,' I admit his premises, but deny his conclusion. But when he argues, "This and that and the other unsupported bodies have fallen, This stone is an unsupported body, 'Therefore it will fall,'" I admit the truth of his conclusion. In both cases he argues from true particular propositions. We have to inquire (1) how he came to choose *those* particulars in order to prove his conclusion; and (2) how it happened that apparently the same method led, in one case, to a false conclusion; in the other, to a true one.

I think we shall see how to answer the first question if we ask ourselves if a child can believe that snow is sugar because the one is white and the other sweet. We know that he can not. We know that children—human beings in general—*reason from observed likenesses to unobserved likenesses, but never from differences to affirmative conclusions.* We know that the child argued that snow is sugar because *snow and sugar resemble each other in being white—because they belong to the class of white objects. The proof, in a word, that snow is sugar he found in the fact that both are white.* He took one white thing—sugar—to be the type of all white things—judged implicitly that all white things are sugar. He argued, then, that

snow is sugar because it is one of the class of white things, all of which are sugar.

He selects the particular propositions, This unsupported object has fallen, That unsupported object has fallen, etc., to prove that the stone will fall if it is unsupported, for the same reason. Can he believe that a stone will fall because a robin flies, and a geranium bears blossoms, and a maple puts forth leaves in spring time? Certainly not. These facts and the one he believes *do not resemble each other—are not members of a class*. He believes that an unsupported stone will fall, on the ground that this and that and the other body have done so, because he takes this, that, and the other body as types of the class. He has made a class of unsupported bodies, and has judged that those he has observed are examples of the entire class. When, then, he reasons that the stone will fall if unsupported, because this and that and the other body have done so, *he really reasons that it will do so because all unsupported bodies will do so*. We see, then, that there is no essential difference between inductive and deductive reasoning. When I prove a particular fact by other particular facts, I do so because they are members of the same class as the one about which I am trying to prove something, and be-

cause I have already, explicitly or implicitly, reached a conclusion about the entire class. When a universal judgment is *consciously* appealed to, the reasoning is deductive; when it is unconsciously appealed to, it is said to be inductive; and that is the sole difference between deductive and inductive reasoning. I say, "I am going to die some time." You ask, "Why?" "Because all men are mortal." There I appeal consciously to a universal proposition. If I reply, "Because this and that and the other man have died," I certainly appeal, perhaps unconsciously, to a universal proposition, because it is only as this and that and the other individual and I are members of the same class that what has happened to them throws any light on what is likely to happen to me.

We see, then, that we appeal to certain *particular* particulars to prove a fact, because they are included in a universal judgment that we have made.

Now, we see why the same kind of reasoning sometimes leads to a true conclusion, and sometimes to one that is false. All inductive reasoning is deductive reasoning. When the universal implied by the particulars is false, the conclusion based upon it will be false. All white things are not sugar. Hence, it is a mistake to say that snow is sugar because it is white.

- ! All unsupported bodies will fall. Hence I am justified in concluding that this stone will, because this and that and the other bodies have done so when I take them to be types of the class.

The proof in deductive reasoning may always be thrown into the following form called a syllogism :

(*Major premise.*) All white things are sugar ;

(*Minor premise.*) Snow is a white thing ;

(*Conclusion.*) Therefore, snow is sugar.

We see here very plainly again that an act of reasoning may be altogether correct as a process, and yet lead to a false conclusion, because one of the premises is incorrect. That enables us to see why able men so often differ with each other ; they start from different premises. Take the great differences you find between men in matters of politics, science—every department of thought—and you will often find that they rest at bottom on the fact that those who differ started from different major premises. A physicist or physiologist, for example, is very likely to believe that nothing can cause a change in matter but matter. If so, he is almost certain to be a materialist, since it seems evident that the mind does cause changes in the body ; and if it does, according to his ultimate major premise, it must be material. A psychologist,

on the other hand, is about equally certain to assume that nothing can have the characteristics that the mind has without having some of the attributes of a substance. Accordingly, he is almost certain not to be a materialist, because he sees that, if mental facts are merely phenomena of the brain, then the mind is in no sense a substance. One man says, "All measures that tend to promote home production are beneficial. A protective tariff does this; therefore a protective tariff is beneficial." Another says, "Undoubtedly your conclusion is true if your major premise is, but I deny your major premise. I hold that what promotes the interests of individuals promotes the interests of nations." Here we have an argument leading to a conclusion that directly contradicts the first, because it starts from a major premise that contradicts the major premise of the first argument. Compare the argument of Ex-Speaker Reed in the *North American Review*, January, 1890, with the reply of Senator Carlisle—the former defending the rules of the House of Representatives that had just been adopted by the Republican majority, the latter severely criticising them. Reed reasons substantially as follows: Whatever rules are necessary to enable the House to transact business are wise; the rules adopted by the

Republicans are necessary to enable the House to transact business ; therefore they are wise. Carlisle, on the other hand, reasons substantially as follows : Whatever rules enable the Speaker of the House to exercise arbitrary and tyrannical power are unwise ; the rules just adopted by the House enable the Speaker to exercise arbitrary and tyrannical power ; therefore they are unwise.

If you ask how it happens that able men so often start from different premises, you ask a difficult question. One reason undoubtedly is, that the imagination, as we have seen, is the sole audience chamber in which Reality gets a hearing. If for any reason we do not image certain aspects or phases of Reality, they are for us as though they did not exist. The great majority of the facts to which the physicist habitually gives his attention are so well explained by his assumption, that it comes finally to seem like an absolute certainty—precisely as we are inclined to think it absolutely certain that things will behave in the future as they have done in the past. When he occasionally thinks of facts that seem to contradict his assumption, he refuses to believe them. That which is absolutely true can not be contradicted, however it may seem to be. Sometimes we refuse, more or less consciously, to con-

sider but one side of a question. If we are interested in supporting a particular conclusion, it often happens that we will not look at the other side. Members of debating societies generally come to believe that their side is right, whatever they thought at the start. They are looking for arguments on but one side, and they see no others. The Republicans in the House all voted for the Republican rules, and the Democrats against them. A few of both parties, perhaps, voted dishonestly, but I have no doubt that the great majority voted honestly. The Republicans were interested in having their rules adopted, and looked for arguments to justify it; the Democrats were interested in having them rejected, and looked for arguments to justify it.

History abounds in illustrations of the effects of interest on belief.

Every one who has studied the history of Calhoun knows that a great change began to take place in his opinions about the year 1825. Before that time he had been an advocate of a protective tariff, a national bank, internal improvements, a liberal interpretation of the Constitution. About 1825 his opinions on all these questions began to undergo a change, and in a few years he had completely wheeled about. The explanation is, that about this time he had begun to see

that slavery was the controlling interest of the South, and that the only constitutional weapon with which it could be defended was the doctrine of State rights. Under the influence of this perception the only facts that he permitted himself to realize (imagine) were those that supported his favorite doctrine.

Andrew Jackson's history abounds in illustrations of this kind. No man could be his friend and disagree with him. He was not only a very sincere patriot, but he was sure he was right, and therefore that everybody who disagreed with him was wrong. What seemed true to him seemed so self-evident that he could not understand how a man could honestly and honorably differ with him. His feelings not only determined his beliefs, but gave them such intensity that he could not conceive that any one could really doubt them.

The history of men like Alexander Hamilton and Jefferson gives still different illustrations of this truth. Because of natural differences between the things they liked, they inclined to start from different premises in their political reasonings. Jefferson naturally trusted the people and believed in their political capacity. Hamilton as naturally distrusted them, and with his strong love of order and stability it was as natural for

him to believe in a strong government—one strong enough to hold the people in check—as it was for Jefferson to believe in a weak one, because he did not think the people needed much governmental restraint.

From this point of view, it is clear that there are two things to be done in the training of the reasoning powers of our pupils: (1) To train them to reason correctly from given premises; and (2) to give them such training as will diminish, as much as possible, the influence of personal considerations in selecting the premises upon which they base their reasoning—to give them such a love of truth that it will be able to neutralize the influence of all merely personal preferences and wishes. What we want to believe has a great influence on what we do believe, but it has no influence in determining what is true.

Calhoun and the South wanted to believe that slavery was right, and they did; but that did not make it right. In order to defend slavery, they wanted to believe that the doctrine of State rights was true, and they did; but that did not make it true. But their attempt to put it in practice resulted in one of the most fearful civil wars of which history gives us any account. But all that can be done, it seems to me, in the way of diminishing the influence of personal considerations

in determining premises, is, in the first place, to point out the great danger of such influences. We have considered examples of such influences from history; you need not go to history to find them in abundance. Incidents at school, if you are on the lookout for them, will give you ample opportunity to bring home to your pupils the fact that there is great danger that they will be led to believe this or that, not because a candid survey of all the facts shows that it is most probable, but because they wish to believe it. In the second place, we can set them a good example. I do not know how United States History can be taught profitably except by constant reference to current events. Mr. Freeman well says that "History is past Politics and Politics present History;" and the teacher of United States History should constantly try to illustrate "past Politics" by "present Politics," and show how "present Politics" are the necessary results of the Politics of the past. But to do this profitably—to do it without exciting the prejudices of his pupils—he must make it very evident that in all the questions he discusses, his supreme desire is to get at the truth. And he must really *have* that desire. In these and all other questions he should not only allow, but encourage, the utmost freedom of discussion. And when his pupils

have pointed out an error in his reasonings—which they are sure to do sometimes—he should acknowledge it instantly, and thus show his supreme deference to truth.

QUESTIONS ON THE TEXT.

1. Show clearly the difference between inductive and deductive reasoning.
2. What is a syllogism?
3. Illustrate how it happens that able men so often differ with each other.
4. Illustrate the influence of interest on belief.
5. What can you do to train the reasoning powers of your pupils?

SUGGESTIVE QUESTIONS.

1. Give illustrations from your own observations of the influence of interest on belief.

LESSON XXXII.

REASONING.

WE have seen that the only difference between inductive and deductive reasoning is that the one is based on an implicit and the other on an explicit universal.

We will now consider that kind of deductive reasoning that is usually called induction, and to avoid circumlocution I will give it the name that it usually bears.

Induction very closely resembles generalization. Generalization, you remember, is the last of the three processes involved in the formation of a concept. A child directs his attention to two or more objects at the same time—comparison—and after noting their like and unlike qualities, fixes his attention upon the former—abstraction—and thinks of them as the characteristics of a class—generalization. But there is no going from the known to the unknown, and, consequently, no reasoning in the act of generalization. When a child, noting that two or more objects resembling each other in a number of particulars, and

all used to sit in, thinks of the qualities in which they resemble each other as the characteristics of a class—extends, in other words, the name given to them to all objects possessing similar qualities—he does not make an inference about the objects he does not see. He does not say that since these chairs have this and that and the other quality, therefore all chairs have them—that would be an induction. But he says that since these objects are alike in certain respects, I will make a class of them, and *if* there are any other objects that possess the same qualities, I will put them in the same class—call them by the same name.

Of course a child does not definitely think any such thoughts. We know that there is a great difference between what the mind really does and what it is conscious of doing. And when a child sees two objects and calls them dogs—thus putting them in the same class—and when seeing another dog, he says, “dog”—putting it in the same class—it is plain that his mind has taken the course I have endeavored to describe. This is generalization. But there is a wide difference between generalization—making a class of objects—and induction—concluding that since one or more members of a class have such and such characteristics, that therefore they all have it; or that since

something is true of one or more members of a class, therefore it will be true of all. In the one case, we are merely arranging objects into classes ; in the other, we reason from one or more members of the class to the entire class.

From this it is evident that induction presupposes generalization. If in induction I reason from one or more members of a class to the whole class, I must have the idea of the class already formed in my mind.

But reasoning, in turn, makes all but the simplest generalizations possible. A child sees a round, yellow object, takes hold of it, eats it, and in this way learns the kind of sensations it produces through his various senses. He hears his mother call it an orange. The next day he simply sees an orange—does not feel it or taste it—and says "orange." What does he mean? He means, if he uses the word intelligently, that the object would feel thus and so, if he could get hold of it, and taste in such and such a way ; in other words, he is reasoning. Inasmuch as the object that had such and such a color yesterday had such and such other qualities, therefore this object, which has a similar color, will have similar qualities.

We have already seen that inductive reasoning assumes that certain individuals are types of an entire class. *Let us consider this further.*

When I reason that all crows are black because all the crows I have seen were black, I assume that the crows I have seen are types or examples of the entire class. This assumption that we can regard a greater or less number of individuals as types of a class clearly underlies a large part of our inductions, and we never can be quite sure in any case that we have a right to make it. Of course, it is more likely to be true when the instances which we assume to represent the entire class are very numerous. But, no matter how many cases we have examined, it will always be possible that some member of the class that we have not seen may be unlike those we have seen.

An hypothesis is an assumption that we make to account for facts. Our minds are of such a nature that we feel a certain uneasiness when we know a fact that we can not explain, and therefore it is natural for us to try to make some hypothesis or supposition to account for any fact we know. And since, of course, we do not make improbable suppositions to account for facts, or rather since we do not make suppositions that seem to us improbable, we are inclined to regard them as true, so long as they explain the facts. And this is another assumption upon which the greater part, if not all, of our inductions are based.

This assumption can not be so definitely stated as the preceding one. It would not be correct to state it in this form: An hypothesis which explains facts is true. For one great reason why people differ from each other so widely in their opinions is that of two hypotheses that equally well explain the facts, one seems true to one, and the other to another. A dozen men on a jury listen to the same evidence, and part of them base one conclusion upon it, and the rest of them another. This is only another way of saying that one hypothesis that explains the facts seems probable to a part of them, and another to the rest of them. I do not believe that a more definite account of this assumption can be given than the following: We are naturally disposed to believe any hypothesis that does not seem improbable in itself, which explains facts for which we have, apart from it, no explanation.

Since we can not rid our inductions of an element of uncertainty, no matter how cautiously and carefully we frame them, it is evident that, unless we make them as cautiously and as carefully as we can, they are likely to have very little value. "I do not like Jews," says one. Get him to tell you why, and you will find that the reason is that he has known two or three Jews who were not pleasant persons. "It does

not do boys any good to go to college," says another. "John Jones went to college, and he does not know any more than Will Smith does"—as though an examination of the case of John Jones entitled one to an opinion of the whole class of students that attend college. "I do not like people with little noses," says a third; "they are always mean and stingy." The foundation for which is that he has seen one or two people with little noses who were stingy. Doubtless the great majority of the popular superstitions, "Thirteen is an unlucky number," "Bad luck to begin anything on Friday," etc., originated the same way. The best thing we can do to guard our pupils against such inductions is so constantly to call their attention to the necessity of founding their beliefs upon a wide basis of facts that they may get a realization of the danger of doing anything else.

Of course, the first condition of doing this successfully is that you have a vivid appreciation of the dangers of such inductions yourself. And if you have such an appreciation, by encouraging them to express their opinions upon the various matters that come up, you can do something to develop such an appreciation in them. And when you are trying to develop it, first of all in your own mind, and then in

the minds of your pupils, remember that the greatest foe of progress is Ignorance, and that the strongest friends of Ignorance are the Dogmatism and Prejudice to which careless and slovenly reasoning naturally give birth.

We have seen that when we appeal to a general proposition to prove our conclusion, the reasoning is called deductive; when we appeal to particular facts, inductive. When we try to prove one fact by appealing to another which is only valid to prove the one fact we have inferred, so far as it has any validity, we are said to reason by analogy.

Argument from analogy is defined by Jevons as "direct inductive inference from one fact to any similar fact." The same author gives the following example: "Thus the planet Mars possesses an atmosphere, with clouds and mist closely resembling our own; it has seas, distinguished from the land by a greenish color, and polar regions covered with snow. The red color of the planet seems to be due to the atmosphere, like the red color of our sunrises and sunsets. So much is similar in the surface of Mars and the surface of the earth, that we readily argue there must be inhabitants there as here. All that we can certainly say, however, is that *if the circumstances*

*be really similar, and similar germs of life have been created there as here,** there must be inhabitants. The fact that many circumstances are similar, increases the probability. But between the earth and the sun, the analogy is of a much fainter character. We speak, indeed, of the sun's atmosphere being subject to storms and filled with clouds, but these clouds are heated probably beyond the temperature of our hottest furnaces; if they produce rain, it must resemble melted iron; and the sun-spots are perturbations of so tremendous a size and character that the earth, together with half a dozen of the other planets, could readily be swallowed up in one of them. It is plain, then, that there is little or no analogy between the sun and the earth, and we can, therefore, with difficulty form a conception of anything going on in a sun or a star."

This kind of reasoning is more uncertain than inductive reasoning. Jevons speaks of the similarity between so many circumstances in the case of Mars and the earth as *increasing* the probability that the former is inhabited because the latter is, and at the same time says that "all we can certainly say is, that if the circumstances be really similar, and similar germs

* Italics are mine.

of life have been created there as here, there must be inhabitants." Need I say that in the very nature of the case we neither know nor can know anything about whether "similar germs of life have been created there as here," and that our knowledge of the extent to which circumstances are similar is so limited that any talk of probability is absolutely without foundation? All that the facts warrant us in saying is, that for aught we know Mars *may* be inhabited, but he who claims to be able to say that it probably is, lays claim to a larger amount of knowledge than falls to the lot of mortals.

QUESTIONS ON THE TEXT.

1. What is the difference between induction and generalization?
2. Show that induction presupposes generalization.
3. Show that reasoning makes all but the simplest generalizations possible.
4. State and illustrate the two assumptions that underlie nearly all our inductions.
5. Define and illustrate argument from analogy.
6. What seems to you its logical value?

SUGGESTIVE QUESTIONS.

1. Give illustrations from your own experience of over-hasty inductions.

LESSON XXXIII.

THE PRIMARY INTELLECTUAL FUNCTIONS.

WE have studied sensation, perception, memory, imagination, conception, judgment, and reasoning—all modes of intellectual activity. If we pass them in rapid review before us, we shall see that in all of them the mind is discriminating or noting differences, and assimilating or noting resemblances.

What is it to know a sensation? It is to discriminate or mentally separate it from all other sensations. A child has many sensations which it does not know; many sensations which it confuses with other sensations. But a sensation confused with other sensations is a sensation put in the wrong class—precisely as, if one were sorting out ribbons of different colors, the confusing of purple with blue would lead to the mixing of these two kinds of ribbons.

So likewise in perception. The first act of the mind in perceiving is to separate mentally the thing perceived from everything else. You remember that, in the lessons on Attention, we saw that what we perceive depends upon what we attend to. The mind in

attention simply singles out the thing attended to from everything else, and that is discrimination. A dog may stand before you, but if, through pre-occupation or from any other cause, you do not discriminate it from the objects about it, you do not know it. But discrimination is not all that is essential to knowledge. As a matter of fact, when we discriminate we usually know, because assimilation, or the act of putting a thing discriminated into a class, usually follows so closely upon the act of discrimination that the two seem to be identical. But they are not. To pick a piece of blue ribbon out of a scrap bag is one thing; to put it in a box with other blue ribbons is an entirely different thing. A child, seeing a dog, may discriminate it from all other objects, but until he perceives its resemblance to something else, until he assimilates it, he does not know it.

So likewise with memory. What is it to have a perfect recollection of any event? It is to have a definite knowledge both of the event and of the time when it happened. If the event is indistinct, it is not perfectly remembered, and its indistinctness is due to imperfect discrimination and assimilation. If we are in any doubt as to the time, it is because we do not perfectly discriminate it from other times, and do not

perfectly assimilate it to other times. The event happened, say, at eleven o'clock yesterday, but I am uncertain whether it was eleven or twelve, or whether it happened yesterday or the day before—that is, I do not discriminate the hour and the day when it happened from all others.

Possibly you think that in this latter case there is no assimilation. Inasmuch as in any one place there is but one point of time known as eleven o'clock, April 26, 1890, the question may be asked as to how it is possible for assimilation of such a fact to take place? The question can be readily answered if we bear in mind that the state of mind corresponding to the fact "eleven o'clock yesterday" is a complex concept. Before a child can know what is meant by "eleven o'clock yesterday," he must know the meaning of "yesterday" and "eleven o'clock," and this is possible only by discrimination and assimilation. But with the concepts of these two facts as elements, all that is necessary to the formation of the complex concept expressed by the phrase "eleven o'clock yesterday" is a synthesis of the two through the exercise of the constructive imagination. The product of constructive imagination is, of course, an image; but as we can take the image of red color to illustrate the

concept color, so we can take any image to illustrate the corresponding concept.

We have seen that the three processes involved in conception are comparison—putting the attention on two or more objects at the same time, discriminating them from all other objects; abstraction—withdrawing the attention from their unlike qualities and fixing it upon their resemblances, assimilating them; and generalization—extending their name to all other objects having similar qualities—a further act of assimilation.

In order to judge, we must know the subject and predicate; and to do this, we must discriminate and assimilate them. I can not judge that oak trees lose their leaves in autumn unless I know what oak trees are, and what is meant by "losing their leaves in autumn." But to know oak trees, I must discriminate them from all other trees, and assimilate them to each other. The state of mind corresponding to the fact "losing their leaves in autumn" is a complex concept; and to know its elements, as we have seen, we must assimilate and discriminate them.

The same is true of reasoning. When I say that John is a mortal, since he is a man and all men are mortal, my conclusion is the result of two acts of assimilation—the assimilation of John to the class *men*, and of these to the class *mortals*.

When I say that, since this and that and the other unsupported body have fallen, therefore all unsupported bodies will, I have perceived, in the first place, the resemblance between the unsupported bodies I have seen—I have assimilated them; and, in the second place, I have assimilated them to all other unsupported bodies.

Since all knowing consists to so great an extent of discrimination and assimilation, how can there be so many different kinds of knowing? *Because there are so many different facts to be discriminated and assimilated.* The discrimination and assimilation of *single sensations* leads to the knowledge of sensations; of *groups of sensations* to the perception of objects which result in percepts; of *percepts*, to concepts; of *concepts*, to judgments; of *judgments*, to conclusions.

But does not this answer leave the really difficult point unexplained? Granting that there are different kinds of facts to be discriminated and assimilated, and it is easy to see that they would issue in different products. But how is it that there are different kinds of facts? That is the really difficult question.

It may seem that to ask that question is like asking why there are so many different kinds of facts to be known in the universe. But it is not. Granted

that there are things without, how do we come to know them? How does that which is *there* somehow get to be represented *here* in my mind? Granted also that I have lived—have laughed and wept and hoped and feared—have played a part as a conscious being in this strange world. But the past is gone, and with it its experiences. How is it that I am able to *recollect* them? How is it that that which was *there* and *then* somehow gets to be represented *here* and *now* in my mind? Granted also that there are real relations existing between real things, how am I able to assert them? That which gets into my mind is *mental*. How is the merely *mental* transformed into the non-mental, the subjective into the objective?

These, you know, are some of the questions we have been trying to answer, and they help us to realize what we are constantly in danger of forgetting—that our science, instead of having merely to discover the laws that govern ready-made facts, is to a large extent a science of processes—a science that has to discover how its facts come to be.

How, then, do the facts that we know as sensations come to exist? In the way already described—*characterless, indefinite, and undifferentiated experiences, but with latent likenesses and differences, begin to exist.*

How these were transformed into definite sensations has already been explained. Here we have only to note that this transformation was the mind's own work; that what we call a sensation is, in a sense, the product of the mind's own activity—that this activity converted latent likenesses and differences into a consciousness of likeness and difference between definite sensations.

How do percepts come to exist? By the mind's own activity. Sensations existing with certain spatial meanings come to be known as having those meanings. Through the native power of the mind to interpret the brogue of its sensations, to understand the meaning of their local signs, the mind arranges its sensations in space, and the result is a percept.

How do recollections of past experiences come to exist? Again by the mind's own activity. Our experiences succeed each other in time. That we know that they do results from the activity of our minds—the mind retrojects some of its images into the past through its interpretation of their temporal signs, precisely as it projects some of its sensations into space through its interpretation of their local signs.

How do judgments come to exist? Through the mind's power to apprehend the various relations of

reality. *Day precedes night.* The mind apprehends it, and the result is a judgment. *Hamilton originated the financial policy of the Federalist party.* The mind apprehends it, and the result is a judgment. Judgments are the products of the mind's power to apprehend the relations of reality.

In each of these cases we have to note that it was no mere differentiation and classification of ready-made facts that brought about the result. The mind makes its sensations, makes its percepts, makes its concepts, makes its judgments, and so makes possible their discrimination and assimilation.

We know also the *condition* of these various activities. But it is only a condition. The activity of attention ~~is~~ no more to be confused with what results from it than light is to be confused with seeing. The best eye can not see in the dark, and the finest mind can not elaborate its products without attention; but light is not seeing, and attention is not the *fact-making* activity of the mind.

We see also in what this activity consists. It is a *relating* activity—in sensation, bringing characterless experiences into relations of likeness and difference; in perception, combining sensations into relations of space; in memory, combining the various elements of

experience into relations of time ; in conception, combining percepts into relations of likeness ; in judgment, combining percepts and concepts into the various relations of reality apprehended by the mind. If, then, we adopt the name usually applied to this activity and call it apperception, we see that *apperception is that combining activity of the mind that brings order and harmony into our mental life by transforming the consciousness of related facts "into the consciousness of relations."**

Apperception, then—of which, indeed, discrimination and assimilation are modes—is the most fundamental form of mental activity. It makes sensations, and then, in the form of discrimination, separates those that are unlike and assimilates those that are alike ; it discovers the space relations of sensations, transforms them into attributes of bodies, and then discriminates the objects so perceived that are unlike, and assimilates those that are alike ; it discerns the time relations of mental facts, and transforms a succession of experiences into a consciousness of succession ; it combines percepts into concepts, percepts and concepts into judgments, judgments into conclusions.

* See Baldwin's *Psychology*, page 65.

QUESTIONS ON THE TEXT.

1. Define and illustrate discrimination and assimilation.
2. Analyze sensation, perception, memory, conception, judgment, and reasoning, in order to show that in all of them discrimination and assimilation take place.
3. Psychology is to a large extent a science of processes—what is the meaning of that?
4. How does it happen that discrimination and assimilation issue in such different products?
5. Define apperception.
6. What does apperception do in sensation, perception, memory, constructive imagination, conception, judgment, and reasoning?
7. What is the condition of apperception?

SUGGESTIVE QUESTIONS.

1. A child saw a donkey and called it a horse; a rabbit, and called it a cat; a fox, and called it a dog. Why?
2. Report similar facts from your own observation.

LESSON XXXIV.

THE PRIMARY INTELLECTUAL FUNCTIONS.

IN the last lesson we saw that perception, memory, imagination, conception, judging, and reasoning are processes of discrimination and assimilation, exercised on different materials, and that these different materials are themselves products of a more fundamental mode of mental activity, of which discrimination and assimilation are forms.

This being so, the question, How can I impart knowledge most clearly? may be put in another form. From the point of view we have now reached, we are able to see that the question is, How can I supply the conditions of apperception? or, to put it more definitely, though not so accurately, How can I enable my pupils to discriminate and assimilate most perfectly?

This activity of apperception in any of its forms *consists in the establishment of relation. If, then, a new fact is to be apperceived, it must be brought into relations with old facts.* The unknown must be related to the known. Now, in order that this may take place—in order that this relation may be established—it is not

enough that the mind have in the storehouse of memory concepts to which the known may be related; these concepts must be brought out; and the more completely the whole of one's past experience is ransacked for related concepts, the more perfect will be the apperception or assimilation.

We can easily illustrate the truth of this by appealing to our own experiences. Sometimes we read books to "inform our minds," or "to get general information;" sometimes to get definite answers to definite questions. Which do you find the more profitable reading? The last, I am sure; and the reason is that your whole knowledge of the subject to which your question relates is brought to bear on everything you find related to it. Your "apperceiving conceptions . . . stand, like armed soldiers, within the strongholds of consciousness, ready to pounce upon" everything they can bring within their grasp. Read the same book with no question in mind, and those apperceiving conceptions are like soldiers asleep, who let their enemy go by them undisturbed. You get illustrations of the same truth when you re-read a book after a considerable interval. If the book is thoughtful—worth re-reading—you are almost sure to find some suggestive or striking observation that

escaped your notice the first time. I have read Bagehot's "Physics and Politics" many times, but I do not remember that my attention was ever attracted to the paragraph quoted on page 297 until I read it a couple of weeks ago. When I read it before, I had "no receptivity" for it, either because I had no related concepts in my mind, or because they were in the background of consciousness, and therefore, like soldiers asleep, unserviceable. But when I read it two weeks ago, my attention had been attracted to the subject of the paragraph by my own observations, and so my mind pounced upon it with great eagerness.

When you select a subject for an essay that interests you very much three or four months before the time you expect to write it, your experience gives you illustrations of the same truth. You scarcely read a single newspaper, or a magazine article, or a novel, that does not suggest some idea on your subject. You suddenly become aware that there is a universe of thought as well as a material universe, and you find your subject "opening out" into it in every direction. Without that subject in mind, your reading would have had no such result; your apperceiving conceptions would have been asleep; their natural prey would have escaped.

These illustrations enable us to realize that Dr. De Garmo is right when he says that "*the first great function of the teacher is to prepare the way for the rapid and efficient assimilation of that knowledge which the study hour or the recitation period is to furnish,*" and that this function consists in causing "to appear in the consciousness" of the pupil "those interpreting ideas" that enable him to assimilate what is presented to him.*

Before the "presentation," then, of the matter of the lesson, the pupil's mind should be prepared for it. He has read it to get information, or to get a high rank—not to get a definite answer to a definite question. He understands it in a certain superficial way, but he has not assimilated it—he has not made it a part of his mental self. Now, we can help him to do this by putting a definite question before him—by setting a definite end before him—that he may summon all his energies in the attempt to attain it.

And when we have stated clearly the object of the lesson, we can help him still further by helping him to array in consciousness his apperceiving conceptions, so that he will be most fully prepared to accomplish the work. We see the connection between this lesson

* De Garmo's Essentials of Method, page 32.

and some preceding lesson. He does not. We should recall the previous lesson to his mind; we should help him to bring out of the storehouse of his memory everything that bears on the lesson. We can, of course, do this most successfully by asking questions, because in this way we secure from him the greatest amount of mental activity.*

When in such ways the mind of the pupil is prepared for the efficient assimilation of the lesson, the matter of the lesson should be presented—the teacher, of course, requiring as much of this to be done by the pupil as possible. The general form or method of the presentation will, of course, depend upon the object in view. If our aim is to have the pupil discover for himself the definition or principle or general truth we wish him to know, we should use the method already described—the Objective Method. But we have seen that the “play of the mind” there spoken of is, for the most part, a form of apperception or assimilation. If we bear this in mind, we can better supply the conditions for it by bringing his mind into contact with those phases of the reality in question that present the most salient features for the activity of assimilation.

* See on this whole subject the book already cited—by *the* way, a most suggestive and stimulating book.

But if our aim is to impart knowledge, in the usual sense of the phrase, it will be useful for us to remember the following principle: "*Objects and wholes of any kind are more easily discriminated and assimilated—apprehended in general—than qualities and parts.*" The ground of it is evident. Objects and wholes of any kind differ from each other in more marked and striking ways than qualities and parts, and consequently can be more easily discriminated. Since they also resemble each other in a greater number of particulars, they can be more easily assimilated.

But you may easily settle its truth by appealing to your own experience. Which do you recognize more easily and certainly—your friends as wholes, or their individual features? Try to describe the features of your most intimate friends in their absence, and you will see. You will often find yourself ludicrously uncertain as to the shape of the nose, the color of the eyes and hair, to say nothing of less prominent features. All of us likewise recognize a rose when we see it, but it requires the training of the botanist to point out the qualities which distinguish it from all other flowers.

Assuming the truth of this principle, *it is evident that we can best assist* our pupils to discriminate and

assimilate by presenting to them wholes and objects before parts and qualities.

We must not limit the application of this principle to *material* objects and *material* wholes. It applies to *thought* wholes as well. Indeed, strictly speaking, all wholes are *thought* wholes—wholes made by thought, wholes that are wholes because the mind chooses to think of them as such. There is absolutely nothing in existence except the universe which we may not think of as a part if we choose, and absolutely nothing that we can not think of as a whole. The universe, including everything, can not be thought of as a part of anything else. Apart from that, it is *thinking*, and thinking only, which makes a thing a part or a whole.

Many arithmeticians do not keep this fact in mind. A fraction is often defined as one or more of the equal parts of a unit, as though units were things of fixed and unchangeable values. I divide an apple into four equal parts, and you ask me if one of these equal parts is a fourth. I do not know how to answer the question, or rather the question does not admit of an answer until it is made more definite. If you ask me what I call one of the parts in relation to the other three, I answer, a unit. It is *one* in relation to the other three, *two* in relation to eighths, *four* in relation

to sixteenths, and *one-fourth* in relation to the apple. The apple itself is one-fourth when considered in relation to a group of four apples, one-eighth in relation to a group of eight apples, and so on. As the mind decides in what relations it will consider things, it is clear that all wholes, as such, are products of the mind. The reason why certain wholes, as apples, oranges, horses, dogs, etc., are thought of as wholes, in a special sense, is that the purposes of life and their relation to each other make it natural for the mind to consider them as such. If this is clear, we may say that a whole is anything, mental or material, that the mind chooses to regard as a whole. Thus we may think of the life and public services of Alexander Hamilton as wholes. And, in accordance with the principle we have been discussing, the student will be best assisted in getting clear ideas of the life of that great man by having his attention called to its broad general characteristics first, before these are modified and qualified. If the student learns that Hamilton was first a Tory, then a Democrat, and finally a believer in a strongly centralized aristocratic Republic, the broad outlines of Hamilton's political creed lie before him. The qualifications and specific description of these characterizations will put the changes in and final

character of Hamilton's political creed with the utmost definiteness before him. So if your object is to give your class a clear idea of Hamilton's public services, first give them a clear idea of the great work of his life—the strengthening and centralizing of the general government; then they are ready for the details—the measures and influences by which these ends were reached.*

That we must proceed from the known to the unknown is another well-established rule in Pedagogy. It is hardly necessary to say that it is based on the fact that all knowing consists to so great an extent in discriminating and assimilating. When I learn a new fact—till then, of course, unknown—I put it in a class of already known facts.

That we must proceed from the simple to the complex, from the indefinite to the definite, from the unqualified to the qualified, is another well-established pedagogical rule. What is its psychological basis? Plainly that a simple, indefinite, or unqualified fact or statement is more easily discriminated and assimilated than a complex, definite, or qualified fact or statement. If you are teaching a child the form of the outlines of South America, you will succeed best by ignoring its

*See on this subject De Garmo on Method-wholes.

irregularities in the beginning. With the map before him, make him conscious of its general resemblance to a triangle or a ham of meat, or other familiar object, before you try to teach him how it differs in shape from them. If in such ways you fix the general outline in his mind before advancing to the details, you will impart clear ideas. And why? Because you are working in harmony with the laws of his mind.

There is a stronger resemblance between the outline of South America and a triangle than there is between it and any other simple figure, and if the child has a familiar knowledge of a triangle, he assimilates the general shape of South America as soon as his attention is called to it. Indeed, so far as *thought* is concerned, this ease comes under the general principle already spoken of—wholes and objects are more easily discriminated and assimilated than parts and qualities. To *thought*, South America has the shape of a triangle—a whole—qualified by certain irregularities. In other words, just as the mind grasps a whole before it does the parts, so it grasps the triangle in South America before it does the deviations from a triangle. So likewise of the unqualified or indefinite in relation to the qualified or definite. In relation to thought, the unqualified and indefinite are wholes, first

known as such before they are qualified and made definite, and the qualities are parts.

If in this way, which, with Jevons, we may call the Method of Instruction, or by means of the Objective Method—let us call it the Method of Discovery—we have put our pupil in possession of a concept, or definition, or induction, or maxim—we should, as Dr. De Garmo insists, help him to vitalize his knowledge by helping him to apply it.* In teaching history, for example, we are constantly running upon some truth about human nature, or upon some law of economics or politics. To vitalize this truth, the pupil must be helped to see its relation to everything to which it applies within the range of his knowledge and experience.

And here we can see the educational value of

*I can not agree with Dr. De Garmo that this last stage or step always forms a part of a correct method. He holds that "(1) the apperception of new facts in *preparation* and *presentation*; (2) the transition from individual to general notions, whether the latter appear as definitions, rules, principles, or moral maxims; and (3) the application of these general truths to concrete facts, *i. e.*, the return from universals to particulars," are the three "essential stages of a correct method." I think that he makes this second step much too definite, as is evident from what I have said about "the play of the mind about the reality" in discussing the Objective Method. In some cases, as we have seen, "the play of the mind" is simply the appreciation of what is beautiful. How can such appreciation be applied?

"reviews"—it is to give to the student's knowledge that familiarity that makes it possible for him to relate it properly to new knowledge, and to use it in acquiring new knowledge.

Ordinary usage tends to promulgate the idea that reviews are useful only to fix things in the mind of the student in order that he can tell them. If they are only good for that, they are hardly good for anything. There are three stages of knowing. In the first, knowledge is merely implicit; the student can not express what he knows. Such knowledge is useful as a foundation for something better; but if it never leaves that stage, it is almost worthless. In the second, it has become explicit; the student can tell what he knows, but he does not know it fluently enough, so to speak, to use it in thinking. In the third, the student not only knows, but knows so well that he can use his knowledge in thinking; he can use it in acquiring, and also in illustrating, new knowledge. Such knowledge is thoroughly assimilated; it has become a part, as it were, of the warp and woof, the flesh and bone and blood of his mind. To develop knowledge into that shape is the great function of reviews.

QUESTIONS ON THE TEXT.

1. Make a careful summary of the last lesson.
2. In what does apperception consist?
3. What light does it throw on the preparation of the pupil's mind for the lesson? Illustrate.
4. In what should such preparation consist?
5. Explain the methods of instruction and discovery.
6. What principle underlies the method of instruction, and what is its proof?
7. What is a thought-whole? Illustrate.
8. Why should we proceed from the simple to the complex, from the known to the unknown, etc.?
9. What are De Garmo's three "essential stages?"
10. Criticise his statement of them.
11. What is the function of reviews?

SUGGESTIVE QUESTIONS.

1. Give examples of De Garmo's last stage, selected from Geography, History, and Reading.

LESSON XXXV.

DEVELOPMENT.

WE saw in our first lessons that the primary end of education is development. After having made a survey, superficial though it has been, of the intellectual faculties, we may profitably consider a little more closely what it means and what its conditions are.

Aristotle said: "It is a shame not to have been educated; for he who has received an education differs from him who has not, as the living does from the dead." I know not where to go to find a more forcible statement of the nature of education. And yet it is misleading. The difference between the educated and the uneducated man is not so much akin to that between the living and the dead, as to that between the fully developed tree and the seed from which it sprang. The two contrasted ideas are not life and death, but completeness, fullness of life, and incompleteness, defectiveness of life.

In order to get our pupils to obtain that abundance of life and power which it is the object of education to

give, we must, of course, induce them to exercise their powers. If their powers of observation, memory, imagination, reasoning, etc., are to be developed, we must get them to observe, remember, imagine, reason—there is no other way. This is the reason for that oft-quoted maxim that it is not what we do for our pupils, but what we induce them to do for themselves that educates them. You can no more observe or remember or think for your pupils than you can eat or drink for them. But as an intelligent mother can tempt the appetite of her ailing child with food adapted to its digestive powers, so you can induce your pupils to exercise their powers by presenting material adapted to their minds; and the result of a systematic exercise of the powers of the mind is education.

It is putting the same fact in another light to say that all education is the formation of certain habits. Dr. Reed said: "As without instinct the infant could not live to become a man, so without habit man would remain an infant through life, and would be as helpless, as unhandy, as speechless, and as much a child in understanding at three score as at three." This doubtless seems a strong statement, and yet a literal acceptance of it would lead one to under-estimate,

rather than over-estimate, the work of habit. If a child's sensations become more definite, if his perceptions become clearer, if his memory becomes more accurate, if his imaginations come to correspond more and more with facts, if he reasons more and more correctly and logically, it is because of habit. Habit is the architect that builds the feeble, rudimentary powers of the child into the strong, developed powers of the full-grown man. What is the Law of Habit? It is that every time we perform any action, mental or physical, we have more proneness to, and a greater facility for, the performance of that action under similar circumstances than we had before. All the curious gestures, ways of holding the hands, attitudes, modes of speech, and the like that characterize the various people we know, are due to the Law of Habit.

Sully says that the "formation of a disposition to think, feel, etc., in the same way as before, underlies what we call habit," and that "in its most comprehensive sense" it means "a fixed tendency to think, feel, or act in a particular way under special circumstances." He thinks that "habit refers to the fixing of mental operations in particular directions," and hence, that it does not constitute the sole ingredient of intellectual development. He thinks that it is "the element of

persistence, of custom, the *conservative tendency*," and that since "growth implies flexibility, modifiability, susceptibility to new impressions, the *progressive tendency*," "habit is in a manner opposed to growth."

Is he right? Is it true that habit is in a manner opposed to growth? If so, education means more than the formation of certain habits, and I have over-stated the importance of the Law of Habit.

His opinion grows out of a failure to distinguish between *habits* and the Law *Habit*. Many particular habits undoubtedly are bad. A man may form the habit of reasoning on insufficient data, or of observing carelessly; he may form the habit of forgetting that he is finite, and so liable to mistakes; that all that he has thought on any subject may be wrong because he may have overlooked some fact already known, or because some unknown fact may contradict all his conclusions. He may form the habit of laying great emphasis on consistency, that "hobgoblin of little minds," and so go through the world with his head turned over his shoulder determining what he will believe to-day by what he believed yesterday. He may form the habit of deciding what he will believe by some other principle than reason. As the Chinese go to Confucius, and Catholics to the Pope, to tell them what to believe, so

he may go to his father, or some politician, or the convention of his party, or his newspaper to tell him what to believe. These habits are unfavorable to growth, and are therefore bad habits; but is there anything in the nature of the Law of Habit to make it necessary for us to form bad habits? Are there not some open-minded, cautious, independent reasoners? And what is an open-minded reasoner? He is one who has formed the habit of being constantly on the alert to find new evidence; one who knows and feels that when men have done their utmost to avoid error, they can not be so sure they are right as to shut their minds to all further considerations; one who has so habituated himself to considering the supreme difficulty of arriving at the truth in any matter of complexity that he is rather inclined to wonder that men are ever right, than to assume that they can consider themselves as undoubtedly right whenever they reach a conclusion. What is a cautious reasoner? He is one who has so accustomed himself to the thought of the infiniteness of the universe, that *what is known* in comparison with *what is*, seems to him like a drop of water in comparison with the Pacific Ocean, and hence he habitually realizes the absolute necessity of collecting as many facts as possible bearing on any matter under con-

sideration before he reaches a conclusion. What is an independent reasoner? He is one who has no Confucius, one who does not go to his father, or to any influential politician, or to his party convention, or his newspaper to find out what to believe—one who does not use his reason to find arguments to defend conclusions furnished him from some external source, but to learn what is true.

Such habits, be it noted, are as much the result of the Law of Habit as are the habits that are opposed to growth. *The Law of Habit tends to make us whatever we want to be enough to express our desires in action.* Is there any antagonism between such habits and growth? Can we say that such habits represent the *conservative* tendency? I can not think so. When teachers come to realize that this characteristic of open-mindedness and caution and independence is not only one of the rarest among educated men, but one of the most important; when they realize that no matter how able and brilliant a man may seem, he is a fossil, a thing of arrested development, precisely to the extent to which he is lacking in this characteristic; when they have become profoundly convinced of the fact that the supreme difference between the most progressive civilizations in the world and such nations

as the Chinese, is that the people of the former have formed the habit, to some extent, of going to reason to tell them what to believe, and the people of the latter have formed the habit of accepting their beliefs on authority, they will not only be sure that there is no antagonism between growth and habit, but that an important part of their work consists in rooting up the habits which would confine the thoughts of their pupils within the thoughts of the past, by helping them to form habits of open-minded, cautious, independent reasoning.

I hope you will pardon me for repeating here that you can not help your pupils to form that habit until you have formed it for yourself. It is the *example* of open-minded, cautious, independent reasoning; it is the fervid appeal to students not to imitate a flock of sheep, who jump when their leader has jumped, and do not jump when he has not jumped, without regard to the considerations that influenced him—a fervor which can emanate only from one who so believes in, as to practice that kind of reasoning; it is the keen and merciless exposure of the utter irrationality of unreasonableness by one whose whole being is saturated with the conviction; this it is that gives students the strongest impulse to the formation of the habit of reasoning in this way.

So far as education consists in the formation of good habits, it is evident that the work of the teacher consists in putting the pupil in such a position as to induce him to act so that good habits will be the result. How can he do this? A consideration of the *factors* and *order* of development will throw further light on this question.

QUESTIONS ON THE TEXT.

1. State and criticise Aristotle's definition of education.
2. What is the Law of Habit?
3. How does Sully define it?
4. Is he right?
5. Distinguish between the Law of Habit and habits.
6. What can we do to help our pupils become cautious and independent reasoners?

LESSON XXXVI.

DEVELOPMENT.

WE saw in the last lesson that a large part of our work in teaching consists in putting our pupils in such positions—bringing such influences to bear upon them—as to induce them to act so that they may form good mental habits. That we may do this successfully, it is desirable for us to have a clear apprehension of the *order* in which the faculties of the mind develop, and the *conditions* of their development.

When I say that the faculties of the intellect develop in a certain order, I mean that they *reach maturity in a certain order*. As we have seen, they begin to develop about the same time. Perception—the second to reach maturity—involves memory, imagination, conception, judgment, and reasoning. But although they begin to develop together, they get their growth at very different times, although in an invariable order.

The order in which they develop is the same in which we have considered them—sensation, percep-

tion, memory, imagination, first reproductive and then constructive; and thinking, in the three forms of conception, judgment, and reasoning.

The older pedagogy maintained that our education of the child should have in view not what is suited to his nature, but what the future man will need. We should teach the child this or that, not because it is calculated to interest him and stimulate him to a right use of his powers, but because the future man will find a knowledge of it useful. Rousseau went to the opposite extreme, and declared that we should forget the future man altogether; that our one aim should be to stimulate the child to observe, to judge, to reason—to exercise his powers, in a word; and that the sole test of the value of knowledge to a child is its stimulating power.

Evidently the proper course is to choose the mean between these extremes—other things being equal, to teach those facts that will tend to develop interests that will be most useful to the future man. The educator should have one eye on the child and the other on the man; he should try to so stimulate the child that his faculties may get the utmost possible development, and, when possible, through the action of his mind on material that the man will find useful. But

whenever we have to choose between ignoring the child or ignoring the future man, by all means let us choose the latter. To forget the child for the sake of the man is like killing the goose to get the golden eggs.

It is, then, our business to inquire, at every stage of a child's development, what powers are most active. We need to know what he can do, since it is only by doing what he can do that he acquires the power to do what he can not do.

Since the power to have definite sensations is first developed, it should be first cultivated. Fortunately for the child, that part of his education is, in the main, attended to by nature. The incessant activity of the child from the beginning of life is a constant training of his senses, under which his sensations become more and more definite. That part of his education is, for the most part, completed before he is old enough to go to school, though the teacher, especially in the kindergarten, can do something in this direction, and the intelligent mother more. The work of each consists in supplying the senses with suitable material.

The faculty which ought especially to claim the attention of teachers in the primary grades is perception. That power is probably most active in the early years

of a child's life. For this reason, children in these grades should be largely employed with objects. At this age, also, children are very active. They like to exercise their physical powers, and particularly dislike inactivity. This fact should on no account be lost sight of by the primary teacher. *Keep children employed on work that is agreeable to them.* It is not the number of hours per day that children sit in the school-room, but the quantity and quality of work they do that educates them.

But here again we should note that the best training of the senses can be given not by the teacher, but by the parent, especially by the mother—best because, unless the child can attend a kindergarten, the best period in his life for the training of his senses is gone before he is old enough to go to school. A child of six, who has been properly trained at home, will have already that love of nature which it is one great object of the training of the senses to give. He will know the name of, and be able to recognize, all the more common cultivated flowers, and all the wild flowers in the country around him. He will be able to recognize all the trees and birds—will know the shapes of the leaves of the trees, and the notes and habits of the birds. Such a child will bring to school a habit of ob-

servation; all that the teacher will need to do is to confirm and strengthen it and direct it in the most useful channels.

The period when memory reaches its maturity—Bain thinks it is when the child is ten or eleven—marks the time designated by nature for the special exercise of the memory. Some exercise of the mechanical memory there must be—some learning by heart; this is the time when it is easiest. This is the time for learning choice selections of prose and poetry. Children show their fondness for rhyme at a very early age. This is one of nature's hints—a hint the heeding of which would much reduce the number of men and women who are blind to the beauties of literature. This is the time for learning the few dates in history that must be learned. But even at this age pupils should not be required or permitted to memorize what they can attach no meaning to.

Both reproductive and constructive imagination should be taken into training at a very early age. Observe a child of three when left to himself, and you will see that he divides his time about equally between three sets of activities—physical activities, apparently due to his love of exercising his physical powers—running, jumping, and a thousand other things, the

only end of which seems to be physical activity—of the senses, and of the imagination. In imagination, he goes to school, writes and receives letters, goes shopping, entertains company—plays the entire comedy and tragedy of life, so far as it has come within the range of his observation and experience. He is very fond of pictures at this age, and of stories about everything that he can even faintly apprehend. These tastes should be gratified to the utmost possible extent. Stories about animals that he knows, about birds that he is acquainted with, so simplified as to be brought within the range of his apprehension, will train his imagination and deepen his interest in those objects. The thousand and one questions that he is constantly asking should be answered when possible, not only for the sake of stimulating his curiosity, but in order to put an image, however indefinite and inaccurate, in place of a mental vacuum. He should be permitted to look at pictures—so far as possible such as have an educational value. If at the age of two or three he comes to know the pictures of Washington and Webster and Clay and Lincoln, when his mother or teacher begins to tell him stories about them two or three years later, his recollection of their pictures will be so many apperceiving ideas, and they will im-

mensely increase his interest in the stories.* Obviously we can in this way also lay the foundation for an interest in geography, and at the same time cultivate his imaginative and observing powers. The imagination of children at school should be cultivated in connection with language lessons. They should read suitable works of fiction, adapted to their stage of development, so as not merely to cultivate their imagination, but to develop a taste for good literature.

The fact that thinking is the last of the powers of the mind to develop designates the place, in a course of studies, where abstract studies, such as grammar, should be taken up. Technical grammar should be left to the High School. It is as absurd to require a child to study technical grammar as it would be to require him to do the work of a full-grown man.

*"Everything known, for which we have the helps of apperception, seems natural to us, because it awakens responses in us, and because we can easily find our bearings in it; the strange and foreign leaves us cold, and awakens at most only our surprise; we know not what we have to do with it; hence the impulse to give significance to everything, to explain it, to relate it to the known; hence, when the name of a man, a city, an event is mentioned, the satisfaction of being able to say, 'I know the man, I have been to the city, the circumstances of the event were so and so,'"—*Lindner's Psychology*, page 128.

Language lessons, in which he is trained to use grammar, should be given him from his first year at school. The pupils in many of the best schools in the country would hardly understand you if you asked them to tell you the parts of speech of the words of any given sentence. They study grammar by studying the masterpieces of our great writers. Recognizing that the primary purpose of the study is to give pupils the power to use the language correctly, the teachers of those schools put before their pupils models of good English, and require them to observe and imitate. This method of teaching grammar not only reaches the end in view, but accomplishes the no less important purpose of bringing the mind of the student into contact with good literature and cultivating his taste for it. But the science of grammar is beyond a child's comprehension, because his reasoning powers are not enough developed, and the attempt to teach it to him generally results in a disgust with the subject and dislike of school.

But we should not forget that though these powers get their growth in a certain order, they are all growing together, and consequently should be exercised together to some extent. Though the primary purpose of object teaching is the cultivation of the ob-

serving powers, reason and memory should not be neglected. And so all along. The skillful teacher will be constantly on the alert for an opportunity to awaken curiosity, to impart useful knowledge, to set his pupils to observing, to get them to reason, no matter what the subject may be, or the primary purpose of its place in the course of study.

But why is it that the faculties of the mind develop at all? In other words, what are the *conditions* of development?

Evidently one condition is the action of natural objects on the organs of sense. We have seen that knowledge begins with sensation; that without sensation there would be no knowledge, and that a sensation is that mental state which directly follows upon that change in the brain which normally results from a stimulation of the nerves of sense. If, therefore, there were no stimulations of the nerves of sense there would be no sensation. If the eye never came in contact with light, there would be no sensation of color. If the ear never came in contact with vibrations of air, there would be no sensations of sound, and so on. And inasmuch as feeling and willing are dependent on knowing, it is clear that we should neither feel, nor know, nor will, were it not for the action of

natural objects on the organs of sense. Borrowing a phrase from Sully, we may call this influence the action of the *physical environment*.

But while the mind would be aroused from the torpor of entire inactivity simply by the action of physical objects on the organs of sense, it would remain in a very crude, undeveloped state indeed, if this were the only influence brought to bear upon it. Whether the child would ever learn to walk if he never saw any one walking, I will not undertake to say. But there is no doubt that he would never learn to talk if he did not hear language spoken. And when we realize the almost absolute dependence of thought on language, we shall see that the presence of other human beings is as essential to anything which deserves the name of mental development as it is to the physical support of the child.

If we wish to appreciate how extensive is the social environment, we have only to remember that *everything which brings mind into contact with mind* is a part of it. This being true, it is clear that you may constantly extend your social environment if you choose to do so. When you grasp the meaning of a word before unknown to you, you bring your mind into contact with the mind of every one who has

helped to give that word its meaning. You get from them a new instrument of thought; and the more definite the meaning of the word, and the more precisely you have apprehended it, the more help it will give you in thinking. In like manner, whenever you add to your knowledge of history, you extend your social environment. The knowledge of what other men have thought and done, of what they strove to do and what they failed to do, brings your mind into contact with their minds, enlarges by so much your social environment. Every fact of science which you learn has the same result. Every such fact was first a thought in the mind of its discoverer. He proved it and made a record of it in a book, and thus brings his mind into contact with the mind of every student of the science.

QUESTIONS ON THE TEXT.

1. In what order do the faculties of the mind develop? What does perception involve? Why?
2. What mistake did Rousseau make as to the training of a child?
3. What sort of training should a child's observing and imaginative powers receive before he is old enough to go to school?
4. How should they be trained at school?
5. What benefit will a child receive from learning to recognize pictures of great men and famous places?

6. Give some of the concepts involved in technical grammar that are beyond the grasp of the average grammar school pupil?
7. How should grammar be taught to grammar school pupils?
8. State and illustrate the two conditions of development

SUGGESTIVE QUESTIONS.

1. Give illustrations from your own observations of the great activity of the imagination in early childhood.
2. Give illustrations of the fondness of children for rhyme.
3. Take a child of two whose parents are fond of flowers and who have many varieties of them, and see how many he can recognize.

LESSON XXXVII.

DEVELOPMENT.

HOW potent is the social environment in shaping the minds of men we shall find it difficult to realize. At one time and in one country in the history of the world, we find one idea prevailing, and in another, another. In Sparta, the brave soldier; in Athens, the symmetrically developed man; among the monks of the Middle Ages, the man who had completely renounced the world; among the Jesuits, the man who not only does what his superior directs, but who thinks and feels as his superior does, is the ideal man. What is the explanation of this? Are these ideals the conclusions of different chains of reasoning? Not at all. Question any of those who hold them, and the best answer you will get, the answer that goes to the root of the matter, is that they *seem* to be true. And what is the explanation of this seeming?

Evidently this question is another form of one we have already discussed—the question as to why different men base their beliefs and their lives on different major premises. Here we may note that it is a part

due, without doubt, to the social environment. Walter Bagehot points out the fact that in the great majority of cases our beliefs are due not to processes of reasoning, but to our imitating the beliefs of those around us. He says: "The main seat of the imitative part of our nature is our beliefs, and the causes predisposing us to believe this, or disinclining us to believe that, are among the obscurest parts of our nature. In 'Eothen' there is a capital description of how every sort of European resident in the East, even the shrewd merchant and the post captain, with his bright, wakeful eyes of commerce, comes soon to believe in witchcraft, and to assure you in confidence that there 'really is something in it.' He has never seen anything convincing himself, but he has seen those who have seen those who have seen. In fact, he has lived in an atmosphere of infectious belief, and he has inhaled it. Scarcely any one can help yielding to the current infatuations of his sect or party. For a short time—say some fortnight—he is resolute; he argues and objects; but day by day the poison thrives, and reason wanes. What he hears from his friends, what he reads in the party organ, produces its effect. The plain, palpable conclusion which every one around him believes, has an influence yet greater and

more subtle; that conclusion seems so solid and unmistakable; his own good arguments get daily more and more like a dream. Soon the gravest sage shares the folly of the party with which he acts and the sect with which he worships." Every one must have noticed how much more he is influenced by the opinions of an able man whom he meets from day to day than he is by the opinions of a man whom he knows merely through books, but whose ability he estimates as much higher. The reason is that actual contact with a person holding a belief, appeals to the imitative part of our nature more strongly than the simple knowledge, gained by reading, that a certain individual holds the belief.

But not merely are beliefs imbibed in this way due to the social environment, but also, as we have seen, those which are reached by processes of reasoning, provided some other mind thought out the reasons for us. And when we remember how little originality there is in the world, we shall begin to see to what an extent our beliefs are made for us; to what an extent they are due to our social environment. But what we feel and what we will, depend largely on what we believe. When one realizes all this, he begins to feel that he himself, like the food he eats and the coat he wears, is the product of all the world.

We see, then, that the mind develops because the conditions of development are supplied, and that these are the *physical and social environments*. Teachers and schools, of course, influence development as a part of the social environment of their pupils. They influence development by doing more perfectly that which is done to a considerable extent without their aid. What the teacher should do, as we have already seen, is to form as clear a conception as possible of what he wishes to accomplish, and then put the minds of his pupils under such influences that they may develop in the desired direction.

But partly because of the influence of the social environment, partly because of the influence of heredity, the pupils who come to us to be trained present the greatest possible diversity in capacity and character. To expect to get the same results from treating them in the same way would be as absurd as to expect to reap the same harvest from a barren, rocky, worn-out soil as from a fresh, fertile prairie, both being subjected to the same treatment. What the child knows, what he believes, what he likes, must be taken into account at every stage of his education; but what he knows, what he believes, and what he likes depend very much on his social environment.

We ourselves, as his teachers, influence him only as we become a part of his social environment, and we become an effective part of his social environment only through his susceptibility to influence. But this very susceptibility depends largely upon his past social environment. One child, delicate, refined, sensitive, is wounded even by a reproving glance; another, accustomed to cuffs and blows from his earliest childhood, scarcely comprehends the meaning of such mild censure. It is not enough, then, for us to form as clear a conception as possible of what we wish to accomplish, and rely on our general knowledge of mind to guide us in surrounding them with such influences that they may develop in the desired direction. We must study them individually—must try to ascertain how their social surroundings have impressed them—what gaps in the knowledge that children ordinarily have result from the influences they have been subject to—and then try to adapt our methods to them individually, so that they may grow in the right direction.

But what is the right direction? What shall we aim at? Hear Professor Huxley: "That man, I think, has had a liberal education who has been so trained in his youth that his body is the ready servant of his

will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold logic-engine, with all its parts of equal strength, and in smooth working order; ready, like a steam engine, to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of nature, and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of nature or art; to hate all vileness, and to respect others as himself."

With the exception of a single clause, you will note that this entire paragraph is a description of the kind of man that a liberal education should seek to produce. And no part of the man is left out. We should seek to train the body so that it may become the ready servant of the will, and "do with ease and pleasure all the work that, as a mechanism, it is capable of." We should seek to train the intellect so that it may become a "clear, cold logic-engine, with all its parts of equal strength, and in smooth working order." We should seek to train the feelings so that the man may

be "full of life and fire," so that he may "love all beauty," and "hate all vileness," and "respect others as himself." We should seek to train the will so that, in the language of Locke, our pupils may get the power to "cross their own inclinations and follow the dictates of reason."

Were it not that Professor Huxley seems to imply that equal stress should be laid on all the various faculties of the mind, I should be disposed to accept this as a fairly clear statement of what is meant by symmetrical development of the mind and of the man. But I do not believe that all the faculties of the mind are of equal importance. I believe, with Dr. Harris, that there is such a thing as an over-cultivation of the mechanical memory. The function of the memory and the powers of observation is to put before the reason and the higher faculties of the mind materials to act on. When they are cultivated beyond that point, the mind, as a whole, is weakened, instead of strengthened. But would any one say that the reason can be too highly cultivated? Is it possible for a man to have too strong a will, or too intense a feeling of the beauty of what is beautiful, or the hatefulness of what is hateful?

QUESTIONS ON THE TEXT.

1. State and illustrate what you mean by "the end of education."
2. State and illustrate what you mean by the "physical and social environments."
3. State and illustrate how one's environments affect his beliefs.
4. What does Huxley understand by a liberal education?
5. Do you agree with him?
6. What is the difference between the rational and the mechanical memory?
7. What is the function of the memory and the observing powers in our mental life?

SUGGESTIVE QUESTIONS.

1. Give examples of ways in which you can modify your methods to suit different pupils.
2. Illustrate how memory can be cultivated at the expense of the reasoning powers.
3. What can you do to train the will of your pupils?

LESSON XXXVIII.

DEVELOPMENT.

WITH such a conception of your aim, how should you proceed to get the minds of your pupils to reach it? You must watch nature, and then try to improve upon her. To cultivate the observing powers, nature presents objects; you must do likewise. But if you do no more than that, you will add nothing to the education of nature. Object lessons which consist in telling the pupils what *you* have observed do nothing to cultivate their observing powers. You must get them to observe something which they have not observed before; you must get them to observe closely, carefully, systematically. How are you to do this? You can only do it by imitating nature. Nature supplies a motive. The incessant handling of this, and looking at that, which so fill up the time of children, result from their interest in these things. You must interest them; but if you add nothing to the interest which the objects naturally excite, you will add nothing to the education of nature. You must deepen that interest. You must stimulate their curiosity by

asking them questions which they can not answer about objects which they think they know all about. You must connect things they are not much interested in with things which they are interested in. You must give them the pleasure of finding out things for themselves. Above all, you must show an interest in their discoveries—the more the better, if you really have it. Herbert Spencer brings out this point so clearly and forcibly that I hope you will pardon me for quoting him at length: "What can be more manifest than the desire of children for intellectual sympathy? Mark how the infant, sitting on your knee, thrusts into your face the toy it holds, that you, too, may look at it. See, when it makes a creak with its wet fingers on the table, how it turns and looks at you; does it again and again look at you, thus saying as clearly as it can: 'Hear this new sound.' Watch how the elder children come into the room exclaiming: 'Mamma, see what a curious thing,' 'Mamma, look at this,' 'Mamma, look at that,' and would continue the habit did not the silly mamma tell them not to tease her.

"Observe how, when out with the nurse-maid, each little one runs up to her with the new flower it has gathered, to show her how pretty it is, and to get her

also to say it is pretty. Listen to the eager volubility with which every urchin describes any novelty he has been to see, if only he can find some one who will attend with any interest. Does not the indication lie on the surface? Is it not clear that we must conform our course to these intellectual instincts; that we must first systematize the natural process; that we must listen to all the child has to tell us about each object; must induce it to say everything it can think of about such objects; must occasionally draw its attention to facts it has not yet observed, with the view of leading it to notice them itself wherever they recur, and must go on, by and by, to indicate or supply new series of things for a like exhaustive examination? See the way in which, on this method, the intelligent mother conducts her lessons. Step by step she familiarizes her little boy with the names of the simpler attributes—hardness, softness, color, taste, size, etc.—in doing which she finds him eagerly helping by bringing this to show her that it is red, and the other to make her feel that it is hard, as fast as she gives him words for these properties. Each additional property, as she draws his attention to it in some fresh thing which he brings her, she takes care to mention in connection with those he already knows, so that, by the natural

tendency to imitate, he may get into the habit of repeating them one after another. Gradually, as there occur cases in which he omits to name one or more of the properties he has become acquainted with, she introduces the practice of asking him whether there is not something more that he can tell her about the things he has got. Probably he does not understand. After letting him puzzle awhile, she tells him—perhaps laughing at him a little for his failure. A few recurrences of this, and he perceives what is to be done.

“When next she says she knows something more about the object than he has told her, his pride is roused; he looks at it intently; he thinks over all that he has heard, and, the problem being easy, presently finds it out. He is full of glee at his success, and she sympathizes with him. In common with every child he delights in the discovery of his powers. He wishes for more victories, and goes in quest of more things about which to tell her. As his faculties unfold, she adds quality after quality to his list; progressing from hardness and softness to roughness and smoothness; from color to polish; from simpler bodies to composite ones—thus constantly complicating the problem as he gains competence, constantly taxing

his attention and memory to a greater extent, constantly maintaining his interest by supplying him with new impressions such as his mind can assimilate, and constantly gratifying him by conquests over such small difficulties as he can master. In doing this she is manifestly but following out that spontaneous process that was going on during a still earlier period, simply aiding self-evolution; and is aiding it in the mode suggested by the boy's instinctive behavior to her. Manifestly, too, the course she is pursuing is the one best calculated to establish a habit of exhaustive observation; which is the proposed aim of these lessons. To *tell* a child this and to *show* it the other, is not to teach it how to observe, but to make it a mere recipient of another's observations; a proceeding which weakens rather than strengthens its powers of self-instruction—which deprives it of the pleasures resulting from successful activity—which presents this all-attractive knowledge under the guise of formal tuition—and which thus generates that indifference and even disgust with which these object lessons are not infrequently regarded. On the other hand, to pursue the course above described is simply to guide the intellect to its appropriate food; to join with the intellectual appetites their natural adjuncts—*amour*

propre, and the desire for sympathy; to induce by the union of all these an intensity of attention which assures perceptions alike vivid and complete; and to habituate the mind from the beginning to that practice of self-help which it must ultimately follow."

So it is with every other faculty of the mind; your work consists in supplying the conditions of development—presenting the material appropriate to the faculty, and seeing to it that there is a motive to induce the pupil to exercise it.

But while I agree with those educators who think that the work of the school should be made pleasurable, both in order that the pupil may have the strongest motive for studying, and in order that the teacher may have confidence that his subjects and methods only call for a normal exercise of the powers of his pupils, I think that the doctrine is often exaggerated. One of the most popular of our educational papers some time ago said that "the true management of any recitation will make it just as exciting and just as much fun as a base ball game can possibly be." I doubt it very strongly. I do not believe it is possible to make the work of school altogether agreeable. If it were practicable to give each boy and girl a separate teacher, as Locke recommended, we might

possibly avoid requiring a pupil to study any subject when he did not feel like it, or when he preferred to study something else. But in a system of class instruction this is impossible. At a given hour in the day your pupil *must* study arithmetic. Perhaps he has just been reciting his history lesson. If you have made the recitation interesting, he would like to go on with that. You have told him of certain books that treat the matter more fully, and he is eager to look them up at once. But he can not. He is part of a great machine, and as the rest of it moves, so, to a certain extent, must he. Hence the more successful you are in interesting your pupils, the more impossible it is to avoid an element of irksomeness in the work of the school.

Even if it were possible to rely entirely on interest as a motive, I do not believe it would be desirable. To acquire the power to do disagreeable things is an exceedingly important part of education. To say nothing of more important reasons, unless we help our pupils to form the habit of doing what is reasonable, whether it is pleasant or not, their intellectual development will certainly suffer, since no other motive can be relied on to make the boy do the work he ought to do at school, and the man read the books he ought to read in after life.

QUESTIONS ON THE TEXT.

1. How should we proceed to bring about the development of a child?
2. Illustrate at length.
3. Compare our methods in inducing the minds of our pupils to act in a certain definite way with our methods in getting nature to do definite things.
4. Use the comparison to illustrate the necessity of studying children.
5. Can pleasure alone be relied on as a motive to induce pupils to study?

LESSON XXXIX.

THE STUDY OF CHILDREN.

“ALL the roads in the Roman Empire led to the city of Rome.” At every turn and corner in our study of our subject, we have seen that successful teaching demands a close and careful and systematic study of children. At this stage in the history of the world, men have come to clearly realize the fact that, no matter what happens in the physical world, there is a cause for it. If a watch stops, or a lock refuses to act, we know that there is a cause for it, and that a patient study of the facts of the case may enable us to discover and remove it. That is precisely the attitude which we should take toward our pupils. If they are not interested in any particular subject, if they are inattentive, if they do not like to go to school, there is a cause for it, and it is our business to learn what it is. Let us not be guilty of the stupidity of saying that some boys “naturally” dislike school. That is an easy explanation to which lazy teachers have a great tendency to resort. But it has a painful likeness to some of the explanations of the Middle Ages. “Mov-

ing bodies have a natural tendency to stop," said the scholars of that time. "Some boys naturally dislike books," say many of our teachers now. Precisely as a more careful study of the facts has thoroughly discredited the former explanation, so I believe a careful study of the facts will thoroughly discredit the latter.

That the importance of the study of children is beginning to be generally recognized is one of the most encouraging signs of the times. In the beginning of the study of Pedagogy in this country, it was confined almost entirely to a study of methods. Later, it was seen that the most fruitful study of Pedagogy includes a study of the principles that underlie methods; that in order to know *how* to deal with the human mind, we must know why we deal with it thus and so; and that to know the why of our procedure, we must know the laws that govern it. And little by little educators have come to see that, after all, the textbook on Psychology, which it is of most importance for teachers to study, is one whose pages are ever open before them—the minds of their pupils, and the children with whom they come in contact. Never before in the history of the world was the importance of the study of Psychology to teachers so generally

recognized as now. But as suggestive as a knowledge of it is to thoughtful and intelligent teachers, the best result to be expected from it is the development of what Dr. Josiah Royce calls the psychological spirit*—the habit of observing children—and of the power to turn that spirit to the utmost possible account. In the first two chapters, we considered the benefits of the study of Psychology to the teacher. The conclusions there reached were such as seemed evident from the very nature of the case, independently of any special conclusions that our study of the mind would enable us to reach. And while I believe that we shall all agree that the claims there made for it are fully borne out by the facts, I think we shall feel that if our study has made us more interested in the growth and development of the minds of children, more disposed to study them, less ready to dogmatize about them, more eager to learn by actual observation what they can do and what they can not do, what they like and what they do not like, the result of our study will be of incomparably greater value than any there insisted on.

Because Psychology undoubtedly underlies the science of education, I have seen what I can not but

* Educational Review, February, 1891.

regard as a disposition to over-estimate its importance. The opinion seems to be entertained in some quarters that every teacher should be a specialist in Psychology. If by that is meant that he must keep well abreast of psychological research, or that he should even be especially interested in current psychological literature, I enter my emphatic dissent. Many an excellent teacher undoubtedly reproaches himself for his lack of interest in it, forgetting that it is as impossible for every teacher to have a special interest in Psychology as it is for them all to have a special interest in mathematics or chemistry. By no such criterion should a teacher test his adaptation for his work. But if a teacher finds himself without interest in children, if he has no disposition to investigate the causes of the facts that thrust themselves upon him every day, if he finds himself disposed to be content with merely verbal explanations—"stupidity," "prejudice," "natural dislike of the subject," "bad home surroundings," "ugliness," etc., I would respectfully suggest that he carefully consider whether he has not mistaken his vocation. A specialist in Psychology every teacher should not be; special and careful students of the minds of children every teacher should be.

I do not, of course, undervalue the study of psy-

chological literature. But I do believe that the greatest practical benefit it can render to the teacher consists in the help it can give him in his study of children's minds.

Two of the leading institutions in the country for the training of teachers* lay great stress on this study of children.† Through the kindness of Professor Walter L. Hervey,‡ Dean of the New York College for the Training of Teachers, I am able to give the entire list of directions and cautions relating to this subject which he puts in the hands of his students.§ They are as follows:

OBSERVATION OF CHILDREN.

A.—*Cautions.*

1. Do not think that only the remarkable sayings and doings of precocious children are to be observed. No act of a child is so common or so habitual that it may not furnish a datum for observation, analysis, generalization.

2. Be careful that your report be accurate—what

*The New York College for the Training of Teachers and the State Normal School at Worcester, Mass.

†This work was begun by the students of the Normal Department of the Ohio University last year (1890).

‡I take this occasion to acknowledge my indebtedness to Professor Hervey for a number of valuable suggestions.

§Through a mistake, for which *I alone am responsible*, this list was incorrectly printed in the first edition.

you see, not imagine; that it be scientific—giving name, age, date, and other essential data.

3. Never allow a child to know that he is observed.

4. Avoid drawing conclusions, even in your own mind, from too few data. Darwin observed worms many years before he dared to write about them.

B.—*Things to be observed.*

1. Knowledge.

a. The development of the senses. Which develop first? Which most rapidly?

b. When examining a new object, what quality first strikes them—form, color, taste, use?

c. When asking questions, what kind do they ask?

d. How clear are the mental pictures which they form?

e. A child's curiosity—how limited? how satisfied? how differing in degree in different individuals, and in the same individuals at different times?

f. In what line is the greatest ignorance displayed?

g. The effect of parentage and nationality on the extent and direction of a child's knowledge.

- h.* How do children gain ideas of beauty? Of personal rights, property, etc.?
 - i.* When do they get the idea "I am I"?
 - j.* Study the aptitudes of children as shown in drawing, sewing, building, planning, etc.
- 2. Attention.
 - a.* How can you gain a child's attention? How keep it?
 - b.* How cultivate attention?
 - c.* Under what circumstances have you observed long-continued concentration?
- 3. Memory.
 - a.* What kind of memory is most found in children?
 - b.* When do they begin to exhibit striking differences?
 - c.* What examples of long memory?
 - d.* What instances of logical memory?
- 4. Imagination.
 - a.* Is imagination natural to children?
 - b.* Does the power increase with age?
 - c.* Note examples of lying, real or apparent, resulting from imagination.
 - d.* Note the result of reading "Arabian Nights," etc.

- e.* Study children's ideas of the sky, of death, of God, and spiritual things.
- 5. Reasoning.
 - a.* How soon do children begin to reason?
 - b.* Is there any difference in reasoning power between boys and girls?
 - c.* How and why do children classify? Compare them with older people as to the ability to observe likeness, difference, any relation.
 - d.* At what age, and under what circumstances, have you observed children seeking for cause, effect, means to ends?
 - e.* Why does a child ask "why"?
- 6. Habit.
 - a.* How soon do children begin to form habits?
 - b.* Note the formation of habits.
 - (1) What are formed with ease?
 - (2) What with difficulty?
 - c.* How are habits formed?
 - d.* How are they broken?
- 7. Feeling. Likes and Dislikes. Interest.
 - a.* Amusements, plays, and games—social and solitary.
 - b.* Favorite stories, songs, and myths.
 - c.* Favorite animals.

- d.* Attachment to places—to persons.
 - e.* Aversions, shyness, self-consciousness, pride, fear, anger.
8. Will.
- a.* Do young children have strong wills?
 - b.* When should obedience begin to be required?
How?
 - c.* Is conscience innate?
 - d.* How soon are there any signs of conscience?
 - e.* Examples of confession of wrongdoing brought about by conscience alone.
9. Ways of dealing with children.
- a.* When naughty.
 - b.* When afraid.
 - c.* When shy.
 - d.* When self-conscious.
 - e.* When injured.
 - f.* When angry.
10. Progress of children.
- a.* In the acquisition of knowledge.
 - b.* In gaining command over body, mind, self.
 - c.* In overcoming faults.
 - d.* In the development of will.
 - e.* Compare the progress of children with the

progress of brutes—*e. g.*, teaching a child and a dog to pick up a stick.

II. General observations.

- a.* In what respects do children differ most?
- b.* What is the influence of heredity?
- c.* To what extent do environment and training overcome the effects of heredity?

QUESTIONS FOR CHILDREN—TO FIND OUT THE CONTENTS AND WORKINGS OF THEIR MINDS.

[The plan involves the selection of some ten children, differing in ability, training, and school advantages, in groups of about the same age. Each one is to be asked every question alone. The answers are to be accurately recorded, in uniform style, for filing and comparison.]

I.—*Observation.*

1. How many legs has a fly? How many wings?
2. What can a fly do that you can not?
3. When a horse eats grass, does he walk forward or backward? A cow?
4. How many toes has a horse?
5. How many feet has a snake?
6. How does a robin look? What kind of a nest does she build?

7. What colored clothes does a policeman wear?
8. How does a dog cross a deep stream?
9. What color is the sky?

II.—*Information.*

1. Who is the President of the United States?
2. Where do potatoes come from?
3. What are your shoes made of? What is leather?
4. Where does milk come from?
5. Did you ever see the surface of the earth?
6. Why is it dark at night?
7. How are the streets of the city lighted at night?

III.—*Sense of beauty.*

1. What is the prettiest thing you ever saw?
2. Why do you think it is pretty?
3. What kind of music do you like best?
4. What are the prettiest flowers you know?
5. Do you like pictures? Why?

IV.—*Personal tastes.*

1. What games do you like to play best? Why?
2. What would you like for Christmas?
3. What little boy or girl do you like the best?

Why?

4. Which do you like better, city or country? Why?
5. Would you rather ride in the cars or in a carriage?
6. What colored flowers do you like best?

V.—*Imagination.*

1. If you should go to the moon, what would you see?
2. What are fairies?
3. How does an angel look?
4. What is lightning?
5. What would you like to do when you grow up?
6. What do dogs think about?
7. Can they talk to each other? How?
8. What is Heaven like?
9. How far away is the sky?

VI.—*Reasoning power.*

1. Why does it not snow in summer?
2. Why does a cat make so much noise when she walks?
3. Where do the fishes go when it rains?
4. Why does not a dog walk on two legs?
5. Are snow and rain alike?
6. Why does a fire engine go so fast?
7. What is the use of doors?
8. Why do not grown up people go to school?
9. Do boot blacks like to have it rain?
10. Why does not grass grow in winter?

But if you wish to get the widest and deepest, and at the same time the most helpful knowledge of the

human mind, do not confine yourself to the study of your own mind and that of children, but study the mind of man as it is revealed in history. The sluggish Oriental, the intellectual Athenian, the superstitious Knight of the Middle Ages, are so many different forms into which our common human nature has been carved by that marvelous sculptor—education. The teacher who studies history from the point of view of Psychology will not only find himself in possession of constantly-growing and useful and inspiring knowledge of historical facts, but he will find his knowledge of the human mind enlarging, and his realization of the almost omnipotence of education ever growing more vivid.

QUESTIONS ON THE TEXT.

1. What was the character of the first study of Pedagogy in this country?
2. How is it studied now?
3. Mention some of the cautions which you should bear in mind in studying children.
4. Mention some of the things to be observed.
5. Mention some of the questions to be asked in learning the contents of children's minds.
6. Can you study Psychology in history?
7. State at length the benefits to be derived from the systematic study of children.

THE END.

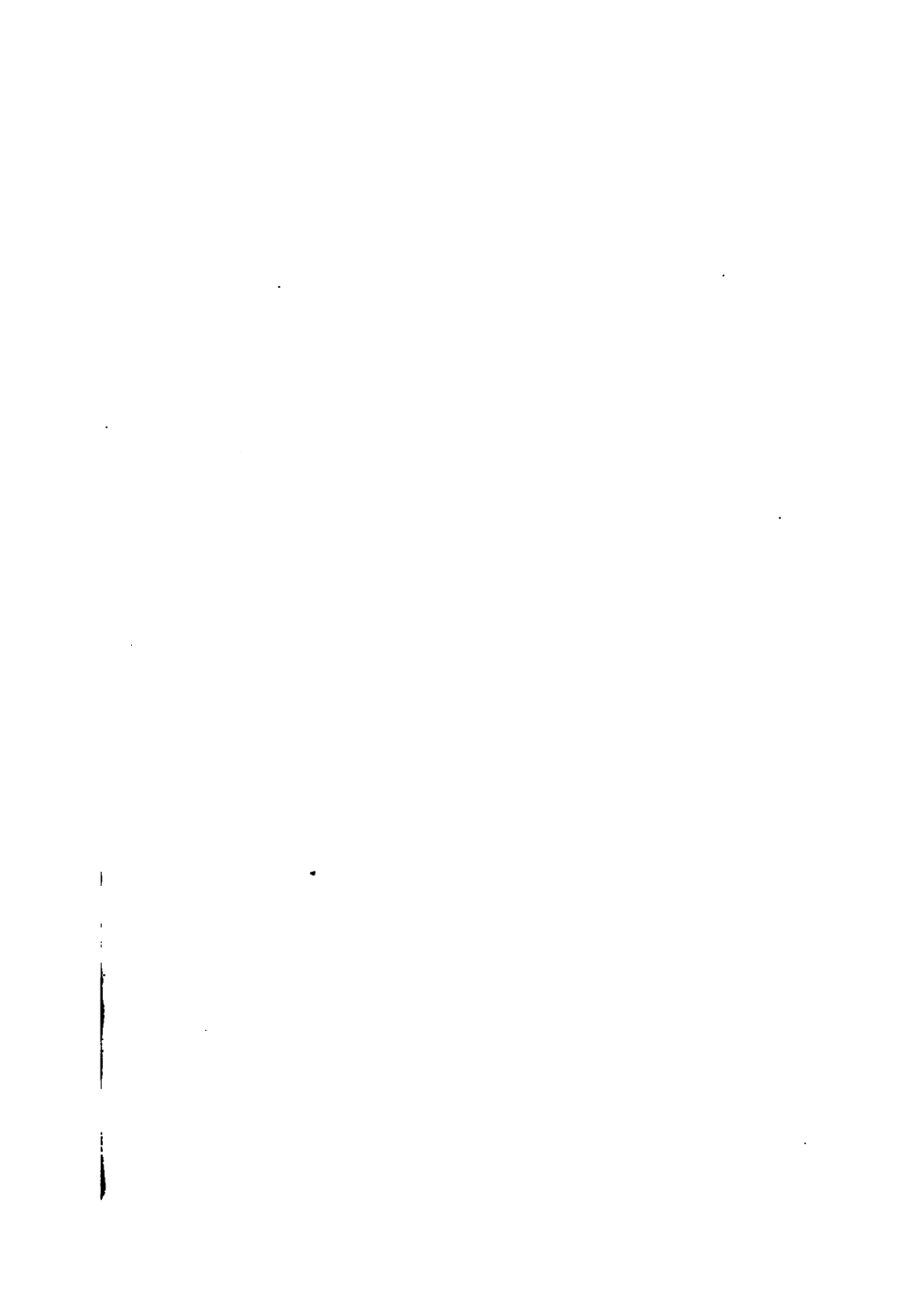
APPENDIX A.

THE case mentioned illustrates a dangerous tendency in our most highly organized schools—the tendency to forget the individual in the multitude. In our zeal for organization, we are in danger of losing sight of the fact that the school exists for the individual—not the individual for the school. However hard it may be to draw the line in practice, the principle is perfectly clear. Whenever it is evident that the individual will be injured by conforming to the requirements that are supposed to be good for the multitude, he should be excused from them. Society has too great an interest in the best possible education of all its members to justify the sacrifice of any of them to the demands of an unattainable and therefore impracticable ideal.

APPENDIX B.

WHEN it is remembered that the inferential method may base its inferences on facts obtained in a variety of ways, it is easy to see that there may be various subdivisions of it. When its facts are obtained by comparing animals with human beings, it is called the comparative method; when by experiment—as when we ascertain how long a time elapses from the contact of an object with any part of the body to the sensation—it is called the experimental method, and so on.

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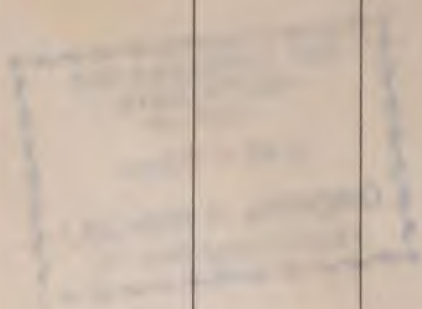


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